304

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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The PHOTOFACT Servicer

Vol. 30. Nos. 303 & 304 ★ Published for all users of Howard W. Sams' Photofact Folders ★ December 1, 1955

The service information in this Servicer provides data on models which we have been unable to present in PHOTOFACT Folders. The receivers are not in current production; a requirement for PHOTOFACT coverage, and we are therefore presenting schematics and supplementary data that will be of assistance when servicing these models.

WESTINGHOUSE

H-769T21, H-769TU21 (Ch. V-2243-1, -3)
H-770T21 (Ch. V2243-1, -3), H-770T21A (Ch. V-2243-4),
H-770TU21 (Ch. V-2243-1,-3), H-771T21 (Ch. V-2243-1),
H-771T21A (Ch. V-2243-4), H-771TU21 (Ch. V-2243-1),
H-772K21, H-772KU21 (Ch. V-2243-1)
H-773K21, H-773KU21 (Ch. V-2243-1)
H-774K21, H-774KU21 (Ch. V-2243-1)
H-775K21, H-775KU21 (Ch. V-2243-1)
H-776T21, H-776TU21 (Ch. V-2243-1)
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H-822K21, H-823K21 (Ch. V-2243-4)
H-830K21, H-830KU21, H-831K21, H-831KU21
(Ch. V-2243-4)

Chassis V-2243-1 . . . Main schematic and production changes.
Chassis V-2243-2 . . . Main schematic, production changes and RF Tuner V-12100-1.
Chassis V-2243-3 . . . Main schematic, production changes and RF Tuner V-12415-1.
Chassis V-2243-4 . . . Main schematic, production changes and RF Tuner V-12400-1.

When the letter "U" appears in the model number, it indicates that the receiver contains an all-channel UHF Tuner in addition to its VHF Tuner. For information on Tuners V-12415-1 and V-12400-1 see Set 255-17.

PRODUCTION CHANGES

In production, any or all of the following changes may be incorporated in the V-2243-1 chassis.

1. SPECIFICATION CHANGES. C100, .005 mfd. and C101, .005 mfd. are replaced with a dual .005 mfd. capacitor. C206, .005 mfd. and C208, .005 mfd. are replaced with a dual capacitor. C209 and C210 have been replaced with a single .0015 mfd. capacitor.

2. ALTERNATE HORIZONTAL OUTPUT TUBE. A 6BQ6G can be substituted for the 6BQ6GT horizontal output tube.

3. IMPROVED UHF RECEPTION. The gain of the pentode section of the 6X8 tube, when operating as an IF amplifier stage for the UHF tuner, has been increased. The 220 ohm cathode resistor, previously out of the circuit during UHF operation, is now grounded by soldering a piece of #22 bus wire from the junction of the 220 ohm resistor and wafer switch section 1B to the ground terminal of wafer switch 2A.

4. TWEET SUPPRESSION. To eliminate tweet interference in the picture which might otherwise occur under certain conditions, a 12K ohm resistor, is inserted between C211 and the junction of R203, C210 and R204. At the same time a filament choke is added in series with filament (pin 3) of the 6BN6 FM detector.

5. INCREASED SOUND ATTENUATION. C302 has been changed from 1.5 mmf to 2.2 mmf. This change increases the attenuation of the sound trap, L301 — C303, to a point where any 4.5 mc. tweet, that might appear in the picture, is suppressed. C301 is now unnecessary and has been removed.

6. SOUND HASH ELIMINATION. To avoid hash in the sound which occurred in some sets due to pick-up of scanning energy in sound system, C319 has been increased to .02 mfd.

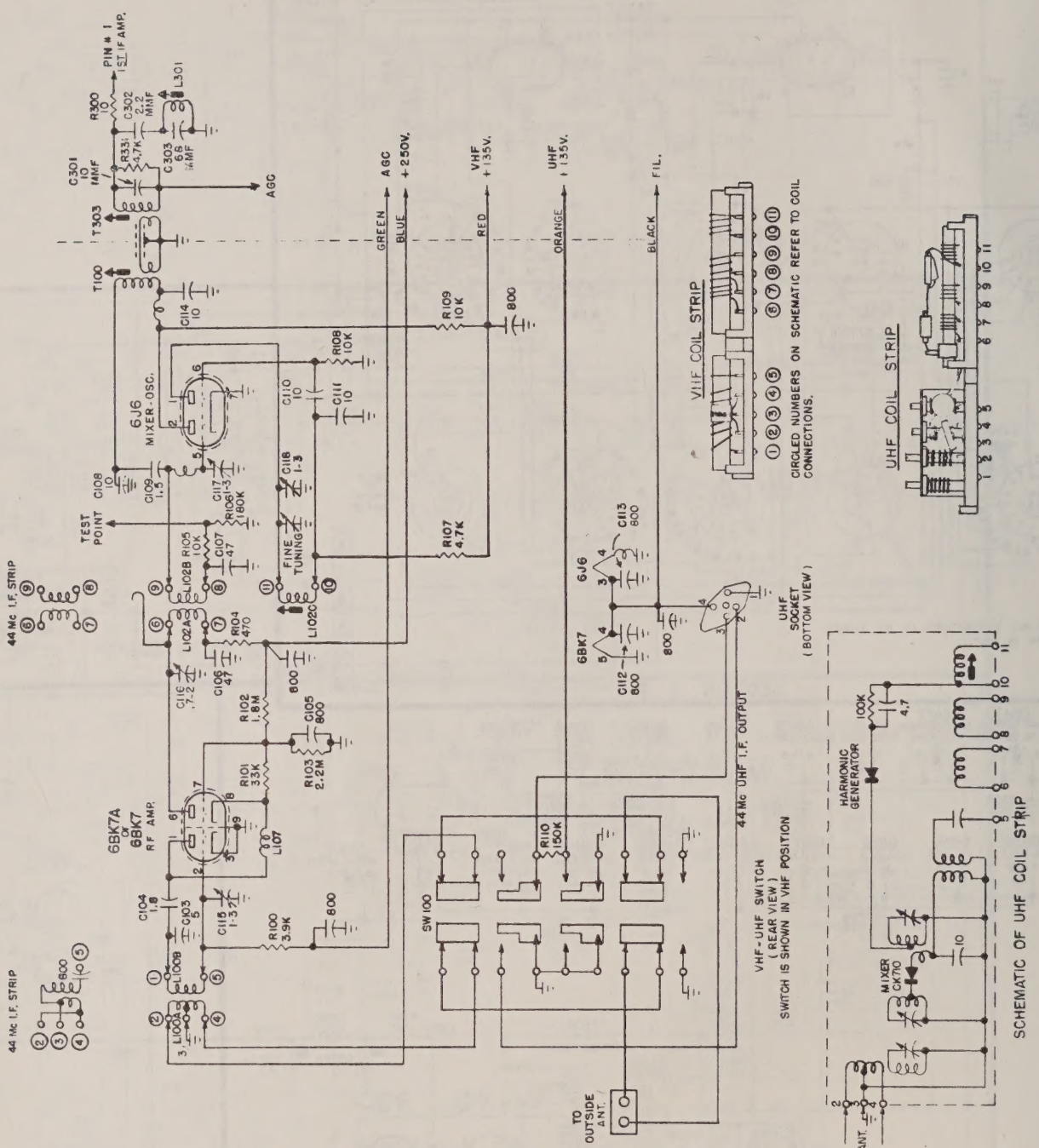
7. IMPROVED PICTURE QUALITY. To reduce ringing in the video amplifier plate circuit, R314 has been changed to 6800 ohms.

8. REDUCTION OF HORIZONTAL DRIVE. To prevent overdrive of the horizontal output stage R435 is increased to 12,000 ohms.

9. IMPROVED AGC PERFORMANCE. To improve the action of the AGC circuit under strong signal conditions and to provide a wider range of AGC control settings, R326 is increased to 390,000 ohms and R327, the AGC control is changed to 750,000 ohms.

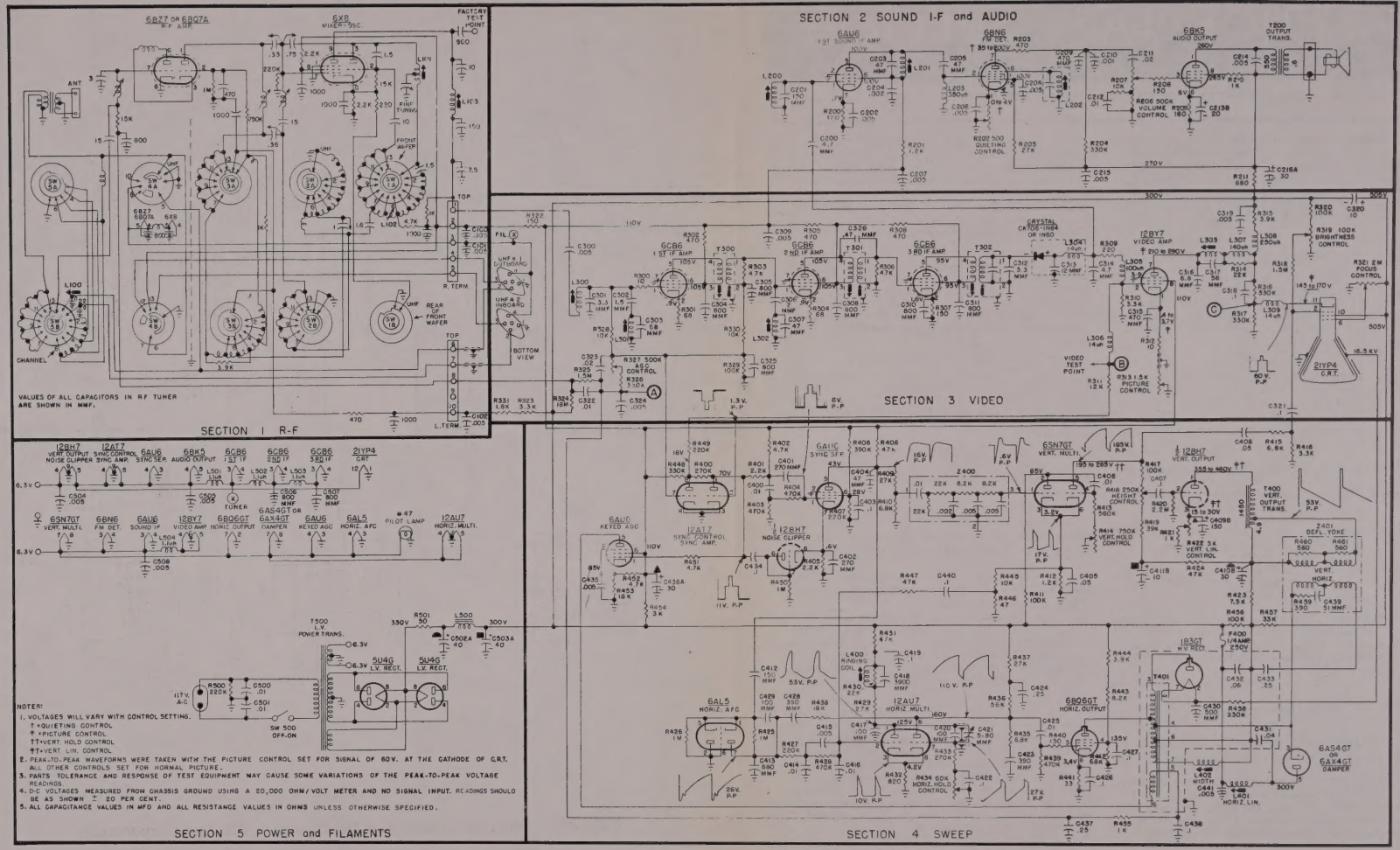
10. DECREASED PLATE DISSIPATION TO REDUCE 6BQ6 TUBE FAILURE. The output voltage of the low voltage power supply has been reduced from 290VDC to 278VDC. To compensate for this change in other circuits, R442, 68,000 ohms and R456, 100,000 ohms have been removed. R444 is decreased to 1800 ohms, the audio decoupling resistor R211 is changed to 560 ohms and a 27,000 ohm resistor has been added in parallel with R454. The power transformer is changed to part No. V-11544-3N.

11. IMPROVE SYNC. The gain of the 6AU6 sync separator tube is increased by reducing the cathode resistor (R405) from 2,700 ohms to 1,200 ohms.



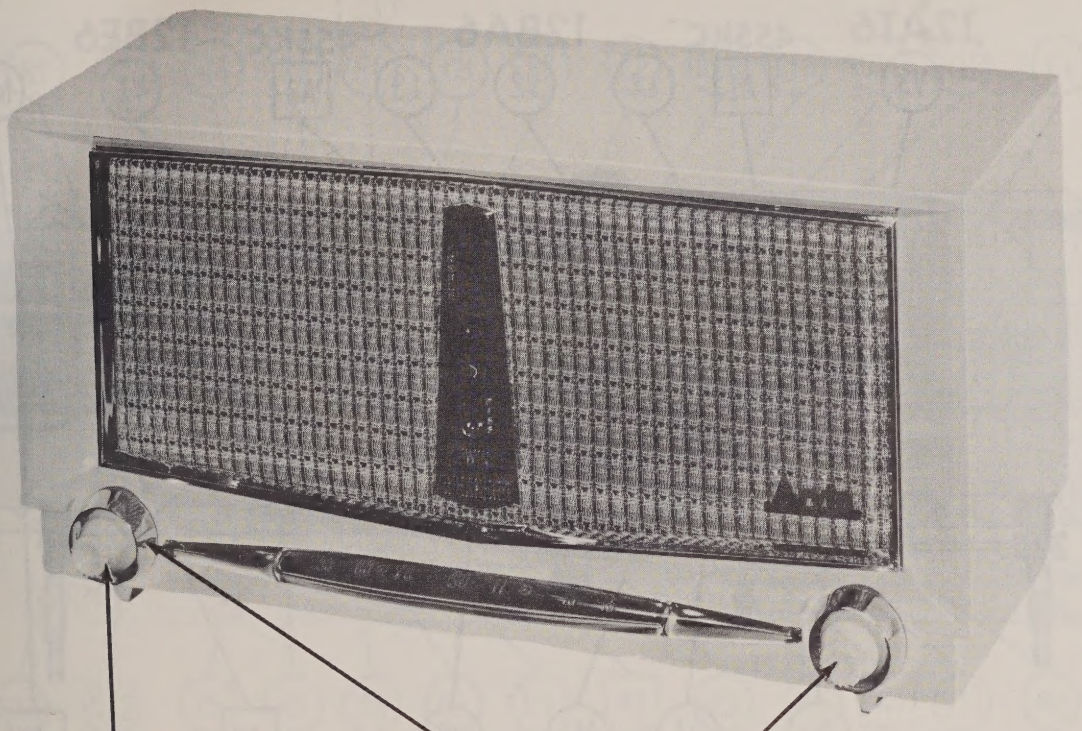
Tuner V-12100-1

(Schematic Diagram Courtesy of Westinghouse Electric Corporation)


SECTION 1 R-F
SECTION 2 SOUND I-F and AUDIO
SECTION 3 VIDEO
SECTION 4 SWEEP
SECTION 5 POWER and FILAMENTS
VALUES OF ALL CAPACITORS IN RF TUNER ARE SHOWN IN MMF.
NOTES:
1. VOLTAGES WILL VARY WITH CONTROL SETTING.
† QUIETING CONTROL.
† PICTURE CONTROL.
†† VERT. HOLD CONTROL
††† VERT. LIN. CONTROL.
2. PEAK-TO-PEAK WAVEFORMS WERE TAKEN WITH THE PICTURE CONTROL SET FOR SIGNAL OF 60V. AT THE CATHODE OF C.R.T. ALL OTHER CONTROLS SET FOR NORMAL PICTURE.
3. PARTS TOLERANCE AND RESPONSE OF TEST EQUIPMENT MAY CAUSE SOME VARIATIONS OF THE PEAK-TO-PEAK VOLTAGE READINGS.
4. D-C VOLTAGES MEASURED FROM CHASSIS GROUND USING A 20,000 OHM/VOLT METER AND NO SIGNAL INPUT. READINGS SHOULD BE AS SHOWN ± 20 PER CENT.
5. ALL CAPACITANCE VALUES IN MFD AND ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.

Westinghouse Chassis V-2243-1
(Schematic Diagram Courtesy of Westinghouse Electric Corporation)

ARVIN MODELS 955T, 956T (Ch. RE392)



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3924 MEADE ST.
DENVER, COLORADO

ARVIN MODELS 955T, 956T (Ch. RE392)

TRADE NAME	Arvin Models 955T, 956T (Ch. RE392)
MANUFACTURER	Arvin Industries, Inc., Columbus, Ind.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-DC RATING .28 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC-1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open.	Across Voice Coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1670KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal.	"	A6	"

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: ARVIN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	Det.-AVC-AF Amp.	12AT6	12AT6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rect.	35W4	35W4	5BQ	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT.	REPLACEMENT DATA: ARVIN PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	NOTES
C1A	70	150	43373	WQ-250	CDB-1013	Q-120	Red
B	30	150					Yellow
C	30	150					Blue
D	20	15					Green

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT.	REPLACEMENT DATA: ARVIN PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	NOTES
C2	.047	200	♦25430	DF-503		PT4147	
C3A	100			♦PC-50	♦1403-01	UC-531	
B	100					UC-531	
C4	.047	400		DF-503		PT4147	
C5	.0022	600		D6-222	GP2-333-222	PT6222	
C6	220			D6-221	GP2K-221	UC-5322	
C7	.0022	600		D6-222	GP2-333-222	PT6222	
C8	.001	600		D6-102	GP2L-102	PT621	
C9	.01	600		D6-103	GP3-333-103	PT611	
C10	.0047	600		D6-472	GP2-333-472	PT6247	
C11	.047	400		DF-503		PT4147	
C12	.047	400		DF-503		PT4147	

♦ Items C3A, C3B and R4 are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ARVIN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	1/2	43282	F1-41		QJ-868R †	UF55A ♦	Tone (Panel)
B	500KΩ	1/2		R2-41			UR55A ♦	Volume (Rear)
C	Switch			KB-1			US-26 ♦	Attach to R1A.

♦Universal Replacement (Mallory Exact Duplicate Part No. UE1395S).
†CONCENTRIKIT EQUIVALENT; K-6 KIT, BASE ELEMENTS AND SHAFTS; B13-133, P17-115 (Panel)
B13-133, R1-126 (Rear)
76-1 (Switch)

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ARVIN PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	22KΩ	1/2	♦25430	BTS-22K	
R3	2.2Meg	1/2		BTS-2.2Meg	
R4	47KΩ	1		BTS-47K	
R5	10Meg	1/2		BTS-10Meg	
R6	100KΩ	1/2		BTS-100K	
R7	330KΩ	1/2		BTS-330K	

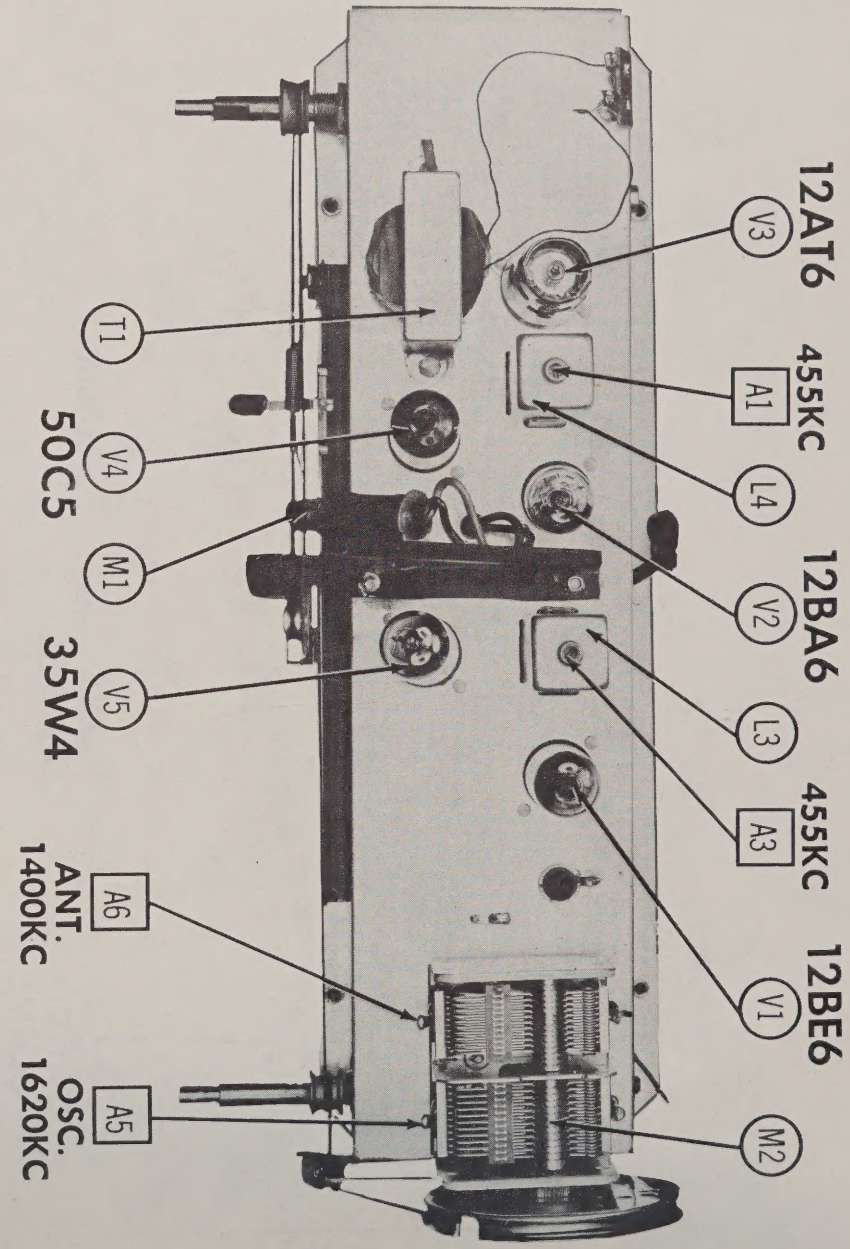
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ARVIN PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R8	220KΩ	1/2		BTS-220K	
R9	1500Ω	1/2		BTS-1500	
R10	150Ω	1/2		BTS-150	
R11	1500Ω	1		BTA-1500	
R12	100Ω	1/2		BTS-100	
R13	330KΩ	1/2		BTS-330K	

♦ R4, C3A, C3B are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: ARVIN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2.3KΩ	3.2Ω	43393-1	Z1102	A-3031	A-3336	24S50A	S-16X	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ARVIN PART No.	QUAM PART No.	
SP1	5"	PM	6.4Ω	43365-1	5A1Z6.4	
SP2	5"	PM	6.4Ω	43365-1	5A1Z6.4	

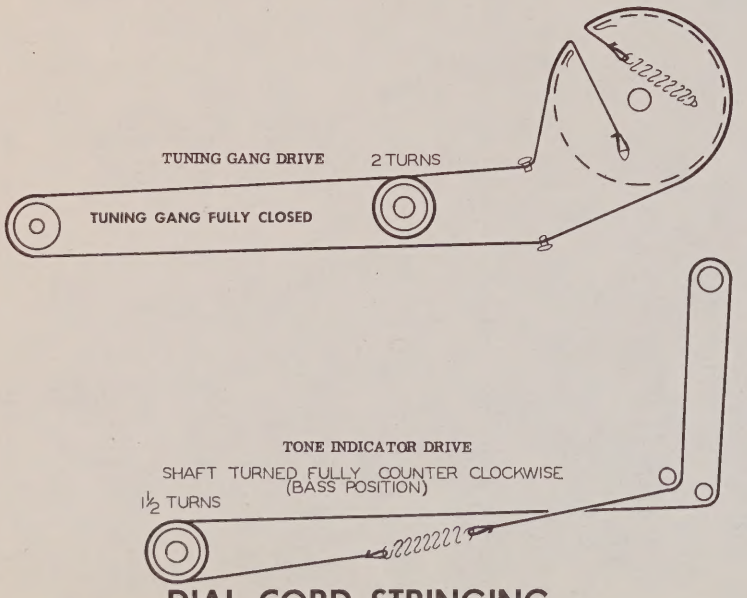
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ARVIN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3.6Ω		43395-1				
L2	Osc. Coil	.6Ω	6.7Ω	25192-1	14-1073*		69-Osc.	
L3	Input IF	14Ω	14Ω	40845-1	16-6758	BC-352	12-C1	
L4	Output IF	14Ω	14Ω	40845-1	16-6758	BC-353	12-C2	

* Leads sufficient mounting support.

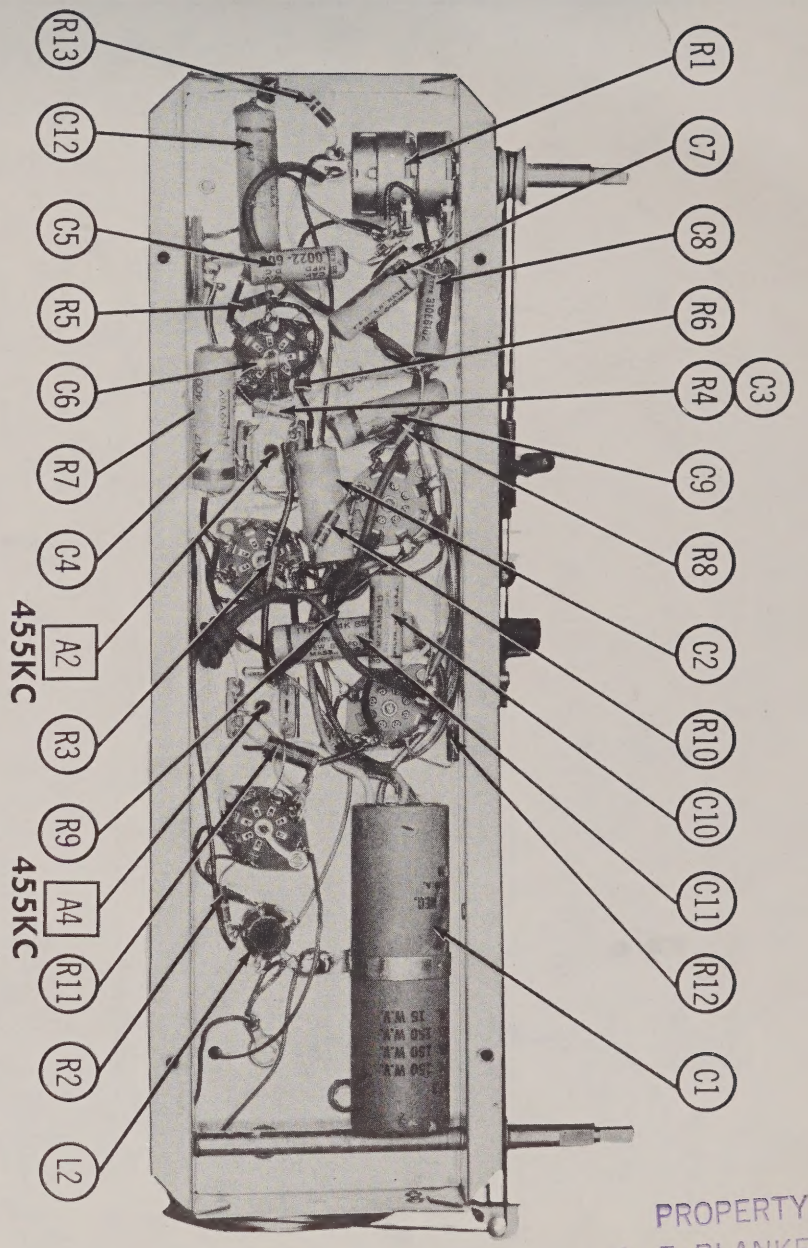
MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M1	Dial Light	19351	#47
M2	Tuning Cap.	43290	2 Gang (14-340MMF, 23-170MMF)
	Cabinet	43397-1	Rosewood
	Cabinet	43397-2	Ivory
	Cabinet	43397-3	Turquoise
	Cabinet	43397-4	Sandalwood
	Cabinet	43397-5	Coral
	Knob	43284-1	On-off-volume & tuning (Rosewood)
	Knob	43284-2	On-off-volume & tuning (Ivory)
	Knob	43284-3	On-off-volume & tuning (Turquoise)
	Knob	43284-4	On-off-volume & tuning (Sandalwood)
	Knob	43284-5	On-off-volume & tuning (Coral)
	Knob	43285	Tone
	Dial Scale	43299	
	Pointer	43391-1	Radio
	Pointer	43392-1	Tone



DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



SET 304 FOLDER 1

ARVIN Model 955T

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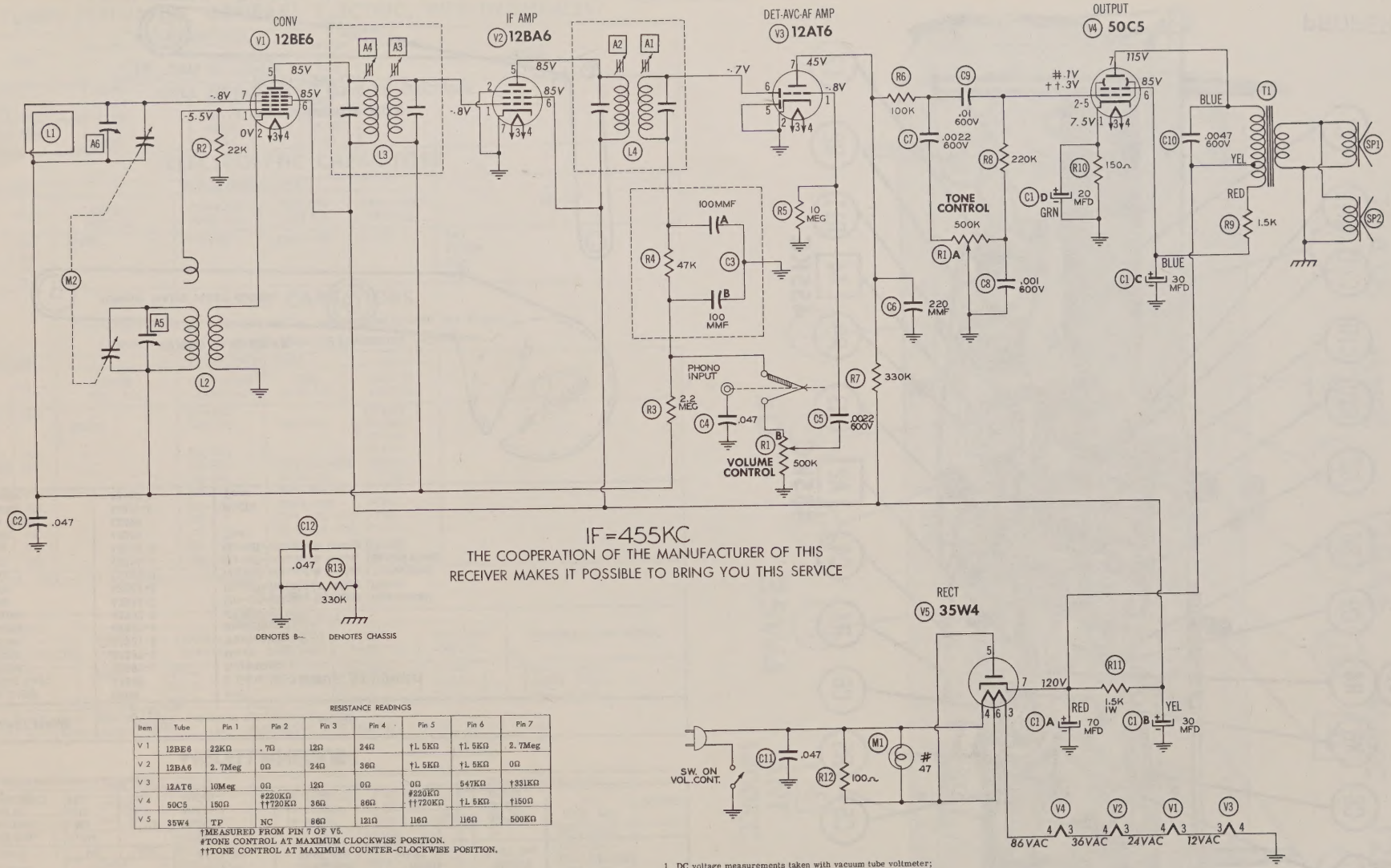

IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	. 7Ω	12Ω	24Ω	†1. 5KΩ	†1. 5KΩ	2. 7Meg
V 2	12BA6	2. 7Meg	0Ω	24Ω	36Ω	†1. 5KΩ	†1. 5KΩ	0Ω
V 3	12AT6	10Meg	0Ω	12Ω	0Ω	0Ω	547KΩ	†331KΩ
V 4	50C5	150Ω	#220KΩ ††720KΩ	36Ω	86Ω	#220KΩ ††720KΩ	†1. 5KΩ	†150Ω
V 5	35W4	TP	NC	86Ω	121Ω	116Ω	116Ω	500KΩ

†MEASURED FROM PIN 7 OF V5.
#TONE CONTROL AT MAXIMUM CLOCKWISE POSITION.
††TONE CONTROL AT MAXIMUM COUNTER-CLOCKWISE POSITION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

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DENVER, COLORADO

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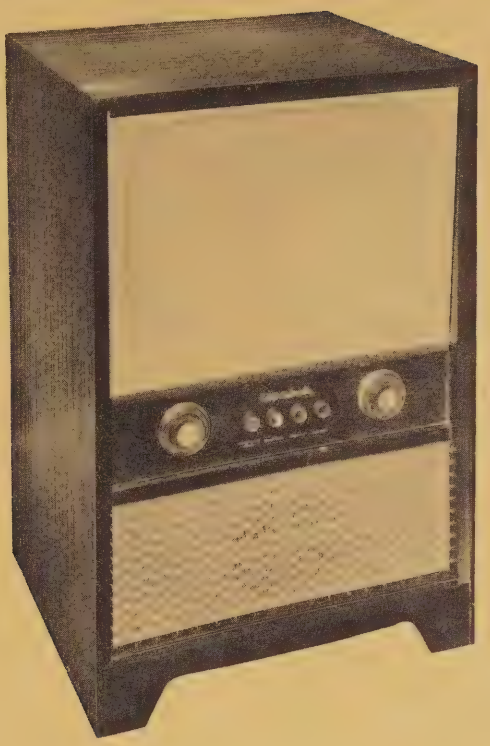
The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



CBS-COLUMBIA MODEL U22C07 (Ch. 921-21)

TRADE NAME	CBS-Columbia	MODELS	CHASSIS
		U22C05, U22C07, U22C07B U22T09, U22T09B, U22T09EB ..... U22T19, U22T19B ..... 22C09, 22C09B, 22T19, 22T19B ..... U23C49, U23C59, U23T15, U23T19 ..... 23C49, 23C59, 23T15,23T19	921-11, 921-21 921-13 921-14 922-7 922-8
MANUFACTURER	CBS-Columbia, A Div. of Columbia Broadcasting System, Inc., 48-50 34th. St., Long Island City, N.Y.		
TYPE SET	Television Receiver		
TUBES	Twenty-two		
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING 1.68 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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PHOTOFACT* Folder

*TRADE MARK

CBS-COLUMBIA U22C05, U22C07, B, U22T09, B, EB, U22T19, B, U23C49, U23C59, U23T15, U23T19, 22C09, B, 22T19, B, 23C49, 23C59, 23T15, 23T19 (Ch. 921-11, -13, -14, -21, 922-7, -8)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 8 push-on type control knobs from front panel of cabinet.

2. Remove 7 wood screws and 1 metal screw. Remove rear cover.

3. Disconnect speaker leads.

4. Remove 4 wood screws holding 2 antenna terminal brackets.

5. Remove 4 chassis bolts. Remove chassis.

6. Remove 2 speaker nuts. Remove speaker.

MODELS	CHASSIS
U22C05, U22C07, U22C07B, U22T09, U22T09B, U22T09EB	921-11, 921-21
U22T19, U22T19B	921-13
22C09, 22C09B, 22T19, 22T19B	921-14
U23C49, U23C59, U23T15, U23T19	922-7
23C49, 23C59, 23T15, 23T19	922-8

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet above and slightly to the left of the channel selector shaft (hole extends thru UHF tuner).

PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass, remove 5 wood screws holding plastic strip at the top edge of the safety glass. Remove plastic strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontal hold control at the center of its range and adjust the horizontal AFC slug (B1) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary slug (A11) located on top of chassis.

FUSES

One fuse is used for LV power supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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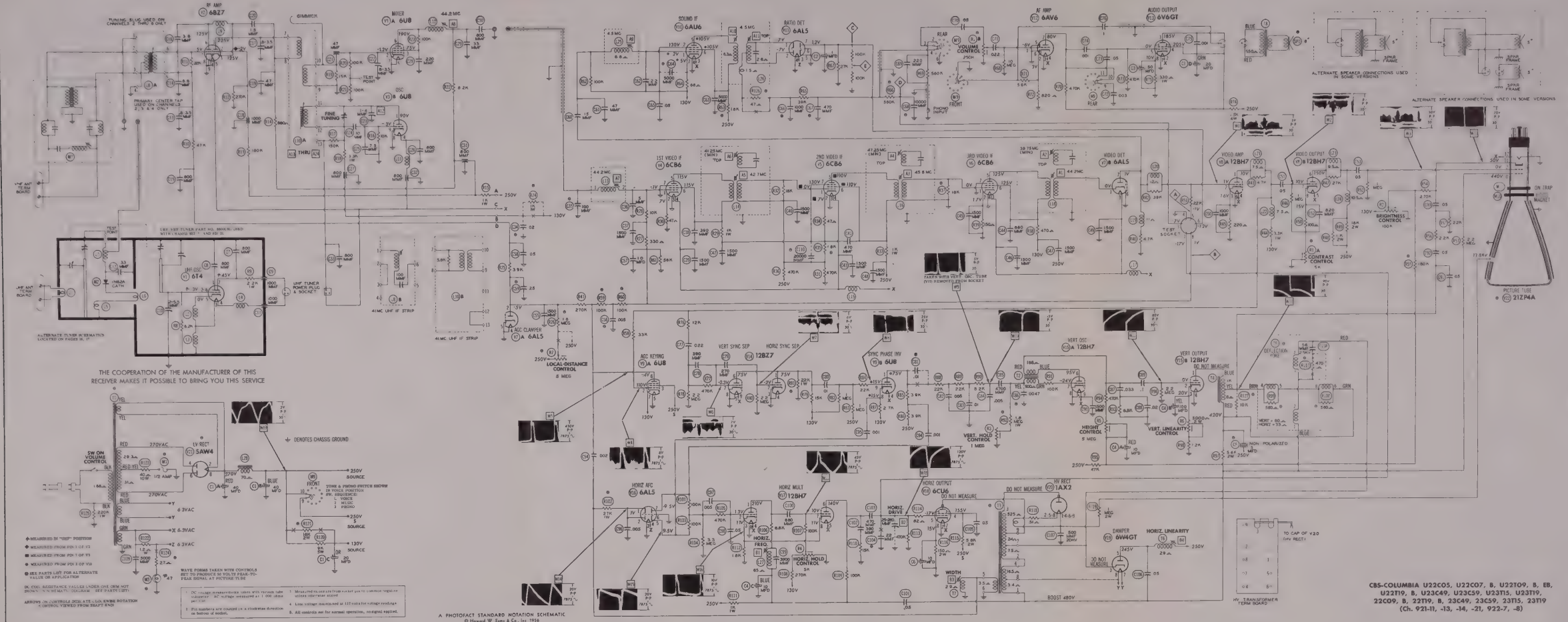
RF AMP V2 6BZ7
MIXER V1A 6U8
OSC V1B 6U8
SOUND IF V10 6AU6
RATIO DET V11 6AL5
AF AMP V12 6AV6
AUDIO OUTPUT V13 6V6GT
1ST VIDEO IF V4 6CB6
2ND VIDEO IF V5 6CB6
3RD VIDEO IF V6 6CB6
VIDEO DET V7B 6AL5
VIDEO AMP V8A 12BH7
VIDEO OUTPUT V8B 12BH7
ACC CLAMPER V7A 6AL5
ACC KEYING V9A 6U8
VERT SYNC SEP V14 12BZ7
HORIZ SYNC SEP
SYNC PHASE INV V9B 6U8
VERT OSC V15A 12BH7
VERT OUTPUT V15B 12BH7
HORIZ AFC V16 6AL5
HORIZ MULT V17 12BH7
HORIZ OUTPUT V18 6CU6
HV RECT V20 1AX2
DAMPER V19 6W4GT
LV RECT V21 5AW4
UHF OSC V1 6T4
PICTURE TUBE V22 21ZP4A
TUNING SLUG USED ON CHANNELS 2 THRU 6 ONLY
GIMMICK
PRIMARY CENTER TAP USED ON CHANNELS 2, 3 & 4
TEST POINT
FINE TUNING
THRU
41MC UHF IF STRIP
UHF TUNER POWER PLUG & SOCKET
VOLUME CONTROL 250K
PHONO INPUT
REAR
FRONT
TEST SOCKET
PARTS WITH VERT. OSC. TUNE (VIS REMOVED FROM SOCKET
ALTERNATE SPEAKER CONNECTIONS USED IN SOME VERSIONS
ALTERNATE SPEAKER CONNECTIONS USED IN SOME VERSIONS
ION TRAP MAGNET
CONTRAST CONTROL 5K
BRIGHTNESS CONTROL 100K
LOCAL-DISTANCE CONTROL 8 MEG
VERT. HOLD CONTROL 1 MEG
HEIGHT CONTROL 5 MEG
VERT. LINEARITY CONTROL 5K
HORIZ. HOLD CONTROL
HORIZ. FREQ.
HORIZ. LINEARITY
WIDTH
BOOST 480V
SW ON VOLUME CONTROL
TONE & PHONO SWITCH SHOWN IN VOICE POSITION
SW. SEQUENCE: 1 VOICE 2 MUSIC 3 PHONO
250V SOURCE
130V SOURCE
6.3VAC
270VAC
DENOTES CHASSIS GROUND
ALTERNATE TUNER SCHEMATICS LOCATED ON PAGES 16, 17
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
DO NOT MEASURE
TO CAP OF V20 (HV RECT)
HV TRANSFORMER (TERM BOARD)
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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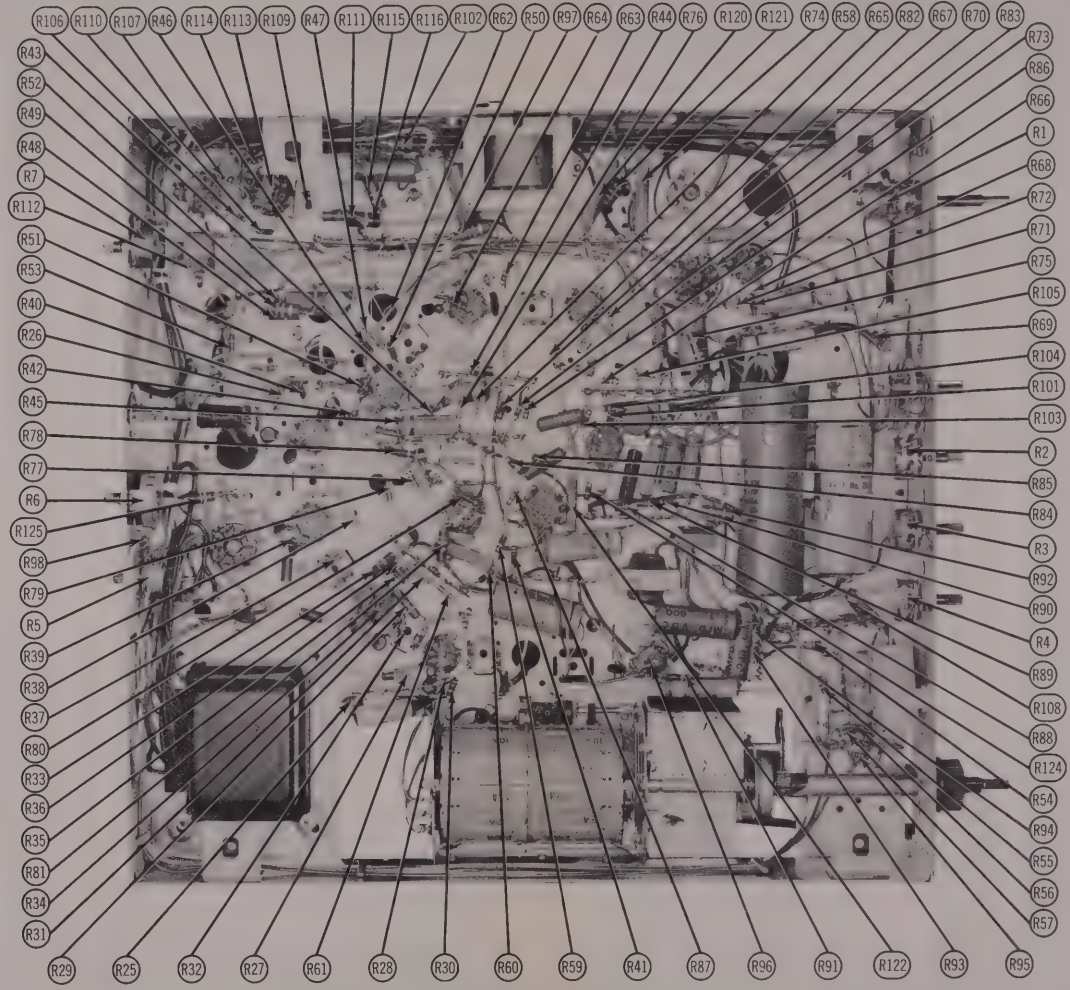
CBS-COLUMBIA U22C05, U22C07, B, U22T09, B, EB, U22T19, B, U23C49, U23C59, U23T15, U23T19, 22C09, B, 22T19, B, 23C49, 23C59, 23T15, 23T19, (Ch. 921-11, -13, -14, -21, 922-7, -8)

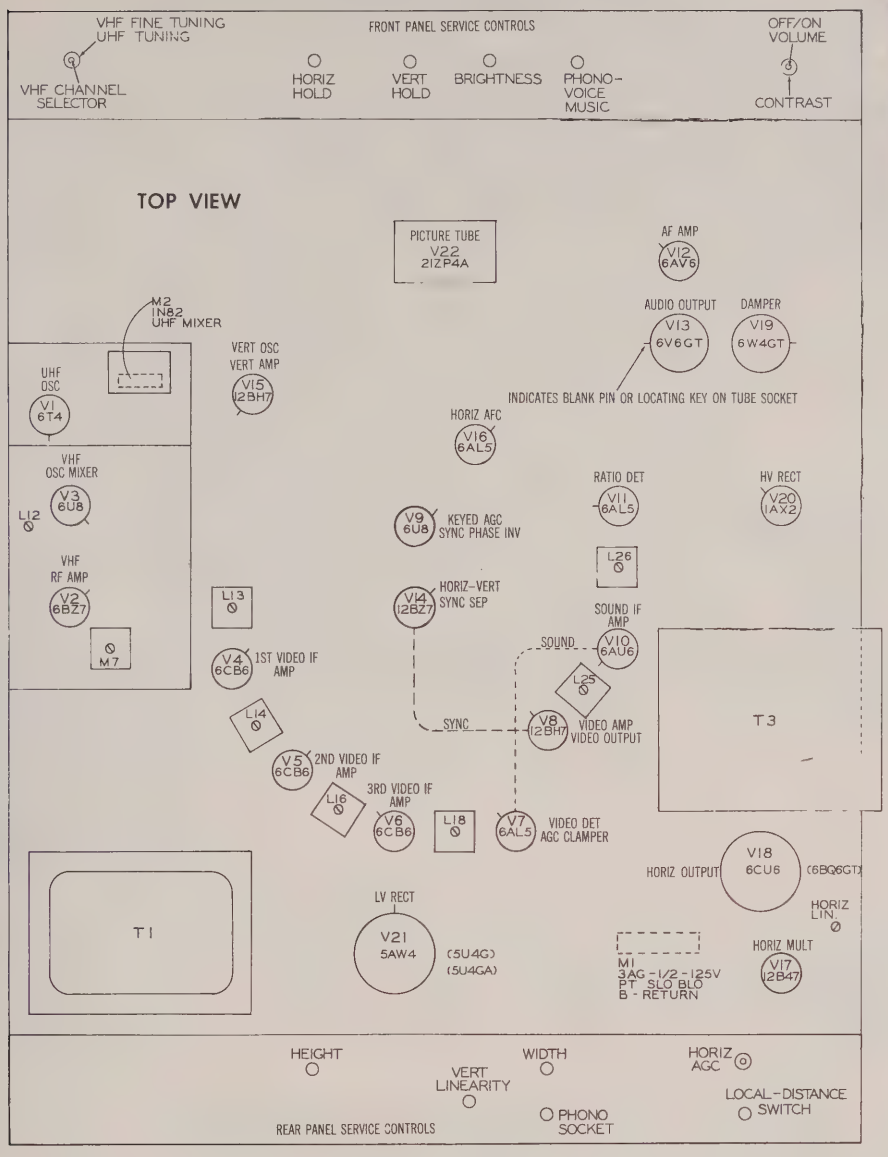
CBS-COLUMBIA U22C05, U22C07, B, U22T09, B, EB, U22T19, B, U23C49, U23C59, U23T15, U23T19, 22C09, B, 22T19, B, 23C49, 23C59, 23T15, 23T19 (Ch. 921-11, -13, -14, -21, 922-7, -8)



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

CBS-COLUMBIA U22CO5, U22CO7, B, U22TO9, B, EB, U22T19, B, U23C49, U23C59, U23T15, U23T19, 22CO9, B, 22T19, B, 23C49, 23C59, 23T15, 23T19, (Ch. 921-11, -13, -14, -21, 922-7, -8)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V21, Fuse (M1)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6, V7 (V1 UHF only)**
No pic, no sound, has snow - **V2, V3, V4**
No pic, has sound, has raster - **V8, V9, V22**
Has pic, no sound - **V10, V11, V12, V13**
Overloaded picture - **V9**

SYNC FAILURE
No vert. sync - **V9, V15**
No horiz. sync - **V9, V16, V17**
No vert. or horiz. sync - **V9, V14**

SWEEP FAILURE
No raster, has sound - **V17, V18, V19, V20, V22**
No vertical deflection - **V15**
Poor vert. linearity or foldover - **V15**
Poor horiz. linearity or foldover - **V17, V18, V19**
Narrow picture - **V17, V18, V19, V20, V21**
Vert. off freq. - **V9, V14, V15**
Horiz. off freq. - **V9, V14, V16, V17**

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DENVER, COLORADO

CBS-COLUMBIA U22CO5, U22CO7, B, U22T09, B, EB, U22T19, B, U23C49, U23C59, U23T15, U23T19, 22CO9, B, 22T19, B, 23C49, 23C59, 23T15, 23T19, (Ch. 921-11, -13, -14, -21, 922-7, -8)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal multivibrator tube (V17).
Allow time for receiver and test equipment to warm up.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery to point (B). Connect the positive lead to chassis.
Set the channel selector between any two channels. This will disable the local oscillator and reduce the possibility of erroneous indications.
Attenuate generator output to maintain 3 volts at VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube (V3). Low side to chassis.	44.2MC (Unmod.)	Between any two channels	DC probe to point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	39.75MC (Unmod.)	"	"	A2	Adjust for MINIMUM deflection. Repeat step 1.
3.	"	"	45.6MC	"	"	A3	Adjust for maximum deflection.
4.	"	"	47.25MC	"	"	A4	Adjust for MINIMUM deflection. Repeat step 3.
5.	"	"	42.7MC	"	"	A5	Adjust for maximum deflection.
6.	"	"	41.25MC	"	"	A6	Adjust for MINIMUM deflection. Repeat step 5.
7.	"	"	44.2MC	"	"	A7, A8	Detune A8 (Turn counter-clockwise). Adjust A7 for maximum deflection.

OVERALL VIDEO IF RESPONSE CHECK

Leave bias connected to point B and chassis.
Attenuate sweep generator output for 3 volts peak to peak vertical deflection on oscilloscope. If a separate marker generator is used, couple it loosely to sweep generator output.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to an ungrounded tube shield floating over converter tube(V3). Low side to chassis.	44MC (10MC Swp)	39.75MC 41.25MC 42.5MC 45.75MC 47.25MC	Between any two channels	Vert. Amp. to point (A). Low side to chassis.	A7, A8	Check for response curve similar to Fig. 1. Adjust A8 to place 45.75MC marker at 50% on high side of response. Readjust A7 for maximum bandwidth at the 50% point on response curve. If necessary, SLIGHTLY retouch A1, A3 and A5 for desired response. A5 affects the low frequency side and position of 42.5MC marker. A3 affects the high frequency side and position of 45.75MC marker. A1 affects top portion of curve. Increase sweep generator output to observe 39.75MC, 41.25MC and 47.25MC trap notches. If necessary SLIGHTLY retouch A2 (39.75MC, A4 (47.25MC) and A6 (41.25MC) for correct trap marker positions as in Fig. 1.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point (C) to chassis. The junction of these two resistors is alignment point (E) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	Direct	High side to point (A). Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	DC probe to point (C). Common to chassis.	A9, A10	Adjust for maximum deflection. Attenuate generator output to maintain less than 10 volts at VTVM.
10.	"	"	"	"	DC probe to point (D). Common to point (E).	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to point (A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any non-interfering channel	Vert. Amp. to point (C). Low side to chassis.	A9, A10	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
10.	"	"	"	"	"	Vert. Amp. to point (D). Low side to chassis.	A11	Reconnect stabilizing capacitor C2. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A10 for maximum amplitude and straightness of crossover lines.

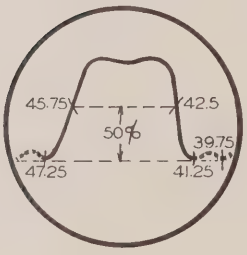


FIG.1

FIG.2

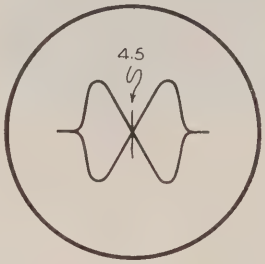


FIG. 3

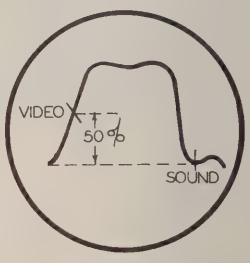


FIG.4

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT

Note: Adjustment A12 (all channel oscillator adjustment) not in VHF Tuner (6900181).
Connect bias as under Video IF Alignment.
Complete Oscillator Alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels, it may be possible to correct them in one step using A12. It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel. If adjustment A12 will not bring all channels well within the range of the fine tuning control, it will be necessary to adjust the channel strip adjustment screw for each channel that is off frequency. The channel oscillator adjustment screws are reached through a hole just above and slightly to the left of the channel switch shaft (hole extends through UHF Tuner.)
The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range.

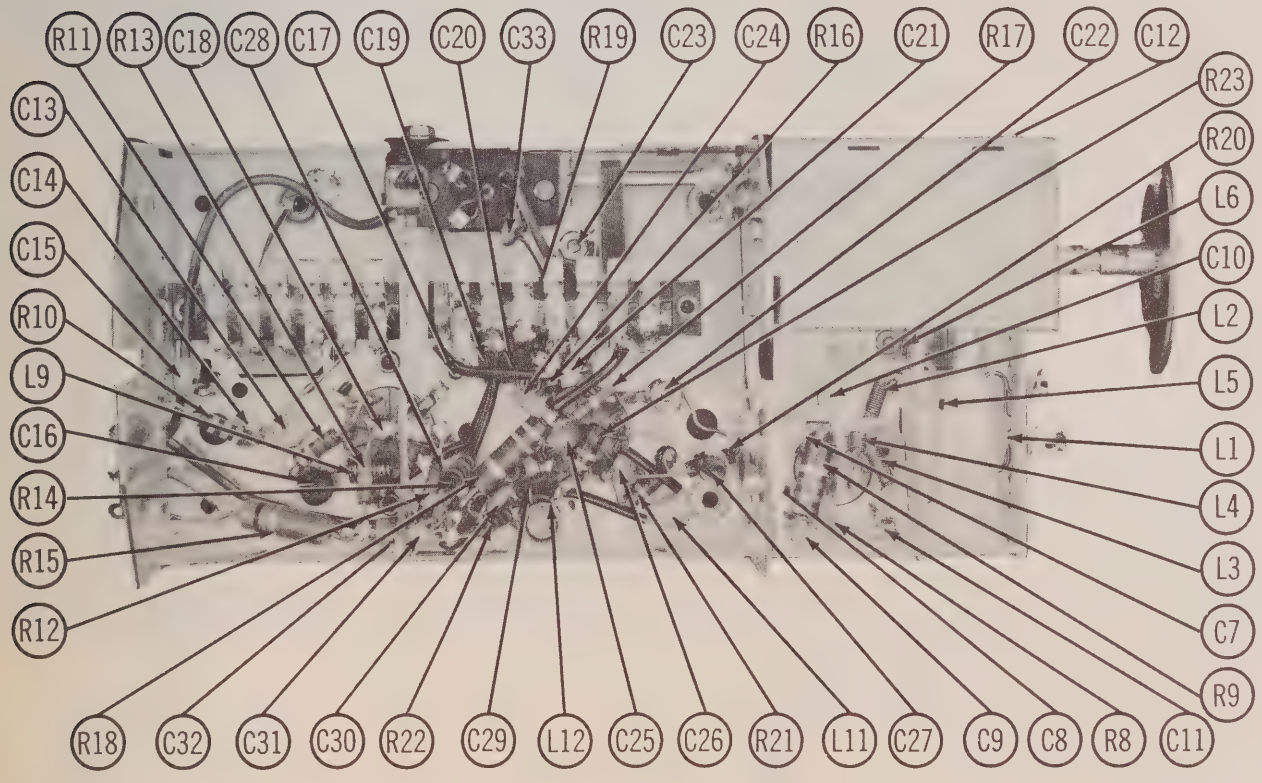
	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point (A). Low side to chassis.	A13	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A14	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A15	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A16	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A17	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A18	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A19	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A20	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A21	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A22	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A23	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A24	

VHF RF AND MIXER ALIGNMENT

The RF and Mixer portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

UHF TUNER ALIGNMENT

The UHF Tuner portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion is not recommended in the field.



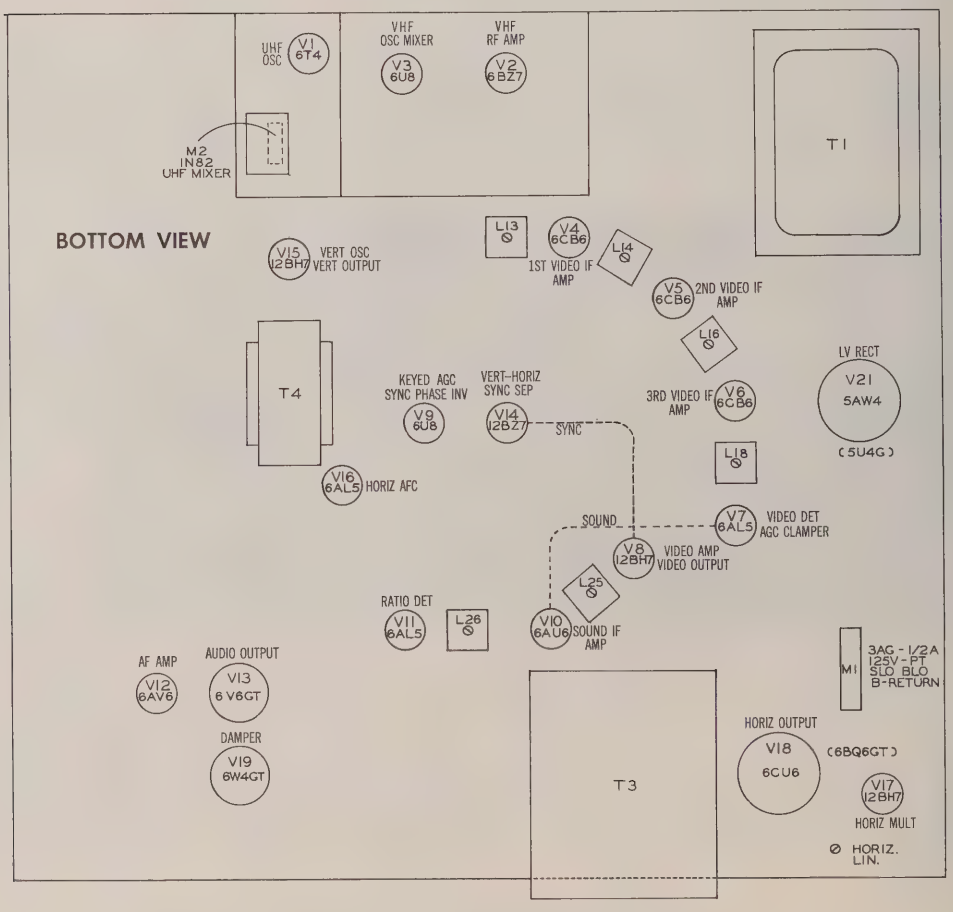
RF TUNER BOTTOM VIEW

CBS-COLUMBIA U22C05, U22C07, B, U22T09, B, EB, U22T19, B, U23C49, U23C59, U23T15, U23T19, 22C09, B, 22T19, B, 23C49, 23C59, 23T15, 23T19, (Ch. 921-11, -13, -14, -21, 922-7, -8)

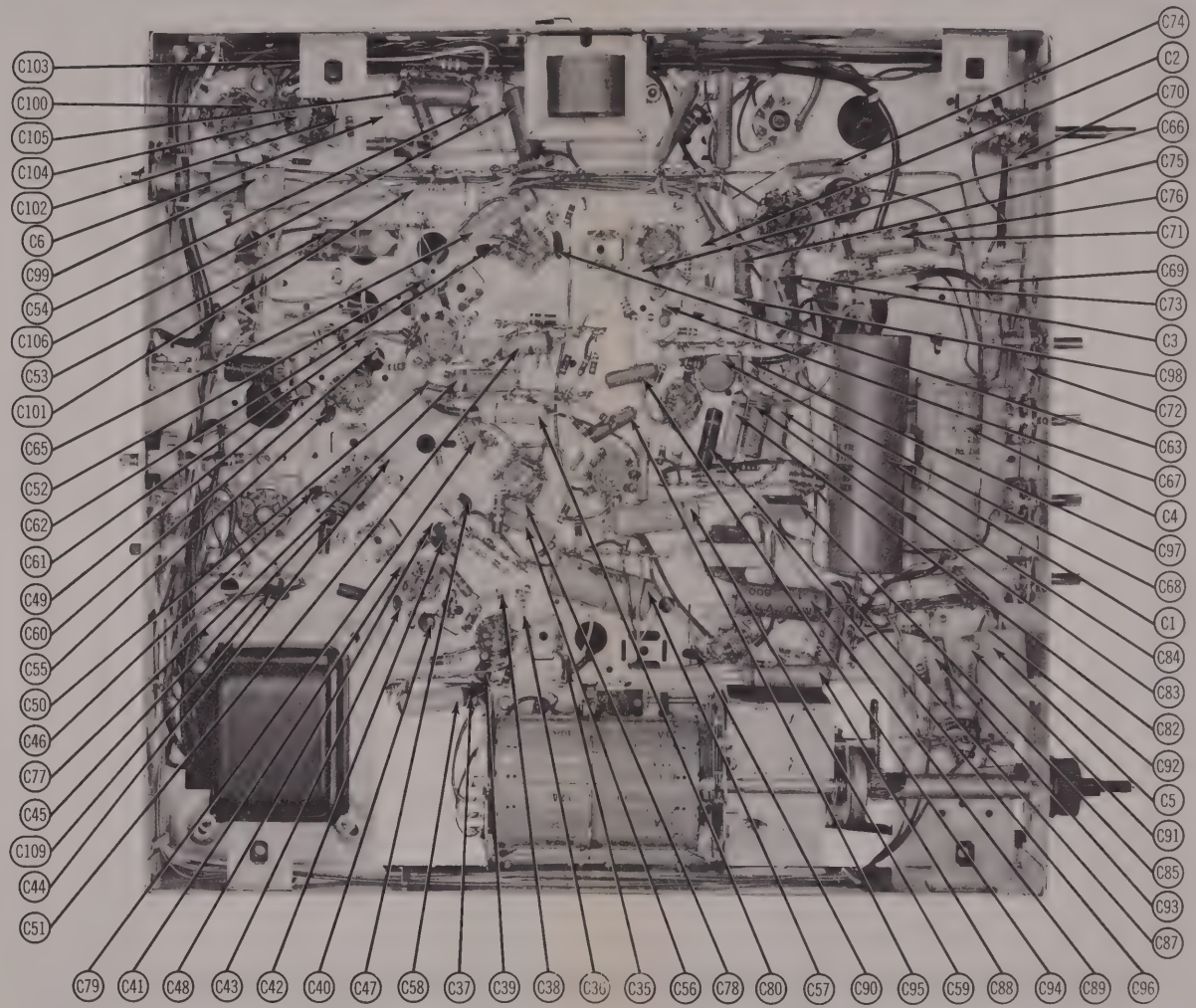
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6T4	*†11. 5KΩ	8. 2KΩ	0Ω	. 1Ω	0Ω	8. 2KΩ	*†11. 5KΩ		
V 2	6BZ7	†1. 7KΩ	130KΩ	INF	0Ω	. 1Ω	INF	550KΩ	0Ω	0Ω
V 3	6U8	†9. 3KΩ	200KΩ	†110KΩ	. 1Ω	0Ω	†9. 3KΩ	0Ω	0Ω	10KΩ
V 4	6CB6	70KΩ	47Ω	0Ω	. 1Ω	▲1KΩ	▲1KΩ	0Ω		
V 5	6CB6	250KΩ	▲47Ω	0Ω	. 1Ω	†1. 1KΩ	†1. 1KΩ	250KΩ		
V 6	6CB6	0Ω	150Ω	. 1Ω	0Ω	†6. 5KΩ	†6. 5KΩ	0Ω		
V 7	6AL5	. 3Ω	500KΩ	. 1Ω	0Ω	0Ω	0Ω	4. 7KΩ		
V 8	12BH7	†9. 3KΩ	4. 7KΩ	220Ω	. 1Ω	. 1Ω	†7. 5KΩ	1Meg	1. 1KΩ	0Ω
V 9	6U8	†8KΩ	†42KΩ	†70Ω	. 1Ω	0Ω	250KΩ	20KΩ	23KΩ	500KΩ
V 10	6AU3	120KΩ	20KΩ	. 1Ω	0Ω	†1. 8KΩ	†1. 8KΩ	20KΩ		
V 11	6AL5	INF	INF	. 1Ω	0Ω	0Ω	0Ω	27KΩ		
V 12	6AV6	10Meg	820Ω	0Ω	. 1Ω	0Ω	0Ω	†470KΩ		
V 13	6V6GT	NC	. 1Ω	†2KΩ	†1. 5KΩ	470KΩ	NC	0Ω	330Ω	
V 14	12BZ7	†19KΩ	2. 2Meg	0Ω	0Ω	0Ω	†19KΩ	2. 7Meg	0Ω	. 1Ω
V 15	12BH7	▬6. 6KΩ	2. 2Meg	1. 8KΩ	0Ω	0Ω	1. 1Meg	2. 5Meg	0Ω	. 1Ω
V 16	6AL5	27KΩ	27KΩ	0Ω	. 1Ω	3. 4Meg	0Ω	3. 4Meg		
V 17	12BH7	†7. 8KΩ	3. 8Meg	1. 8KΩ	. 1Ω	. 1Ω	†100KΩ	100KΩ	1. 8KΩ	0Ω
V 18	6CU6	TP	0Ω	TP	†5. 6KΩ	470KΩ	TP	. 1Ω	150Ω	TOP CAP ▬24Ω
V 19	6W4GT	NC	NC	2Meg	NC	†100Ω	NC	2Meg	2Meg	
V 20	1AX2		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▬550Ω
V 21	5AW4	NC	25KΩ	NC	85Ω	NC	85Ω	NC	25KΩ	
V 22	21ZP4A	0Ω	1Meg	PIN 10 ▬2. 2Meg	PIN 11 ~300KΩ	PIN 12 . 1Ω				

*MEASURED IN "UHF" POSITION.
▬MEASURED FROM 130V LINE.
†MEASURED FROM PIN 8 OF V21.
▲MEASURED FROM PIN 7 OF V5.
▬MEASURED FROM PIN 3 OF V19.
TP-TIE POINT.
NC-NO CONNECTION.



TUBE PLACEMENT CHART



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

CBS-COLUMBIA U22C05, U22C07, B, U22T09, B, EB, U22T19, B, U23C49, U23C59, U23T15, U23T19, 22C09, B, 22T19, B, 23C49, 23C59, 23T15, 23T19, (Ch. 921-11, -13, -14, -21, 922-7, -8)

SET 304 FOLDER 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		CBS-Columbia PART No.	STANDARD REPLACEMENT		
V1	UHF Osc.	6T4	6T4	7DK	
V2	RF Amplifier	6BZ7	6BZ7	9AJ	
V3	Mixer-Osc.	6U8	6U8	9AE	
V4	1st. Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Det.- AGC Clamper	6AL5	6AL5	6BT	
V8	Video Amp.- Video Output	12BH7	12BH7	9A	
V9	AGC Keying- Sync Phase Inv.	6U8	6U8	9AE	
V10	Sound IF Amp.	6AU6	6AU6	7BK	
V11	Ratio Det.	6AL5	6AL5	6BT	
V12	AF Amp.	6AV6	6AV6	7BT	
V13	Audio Output	6V6GT	6V6GT	7AC	
V14	Vert. Sync Sep.- Horiz. Sync Sep.	12BZ7	12BZ7	9A	
V15	Vert. Osc.- Vert. Output	12BH7	12BH7	9A	
V16	Horiz. AFC	6AL5	6AL5	6BT	
V17	Horiz. Mult.	12BH7	12BH7	9A	
V18	Horiz. Output	6CU6	6CU6	6AM	6BQ6GT used as an alternate
V19	Damper	6W4GT	6W4GT	4CG	
V20	HV Rectifier	1AX2	1AX2	9Y	
V21	LV Rectifier	5AW4	5AW4	5T	5U4G or 5U4GA may be used as an alternate

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA					RETMA BASE TYPE	NOTES
	CBS-Columbia PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.		
V22	21ZP4A 21ZP4B ① 21AWP4 ①	21ZP4A 21ZP4B ① 21AWP4 ①	21ZP4A 21ZP4B ①	21ZP4A 21ZP4B ② 21AWP4 ②	21ZP4A 21ZP4B ① 21AWP4 ①	12N 12N 12N	① Aluminized ② Silver screen

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	CBS-Columbia PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	40	350	21000861	WQ795	CDB-4422	Q-325	
B	40	350					
C	20	350					
D	20	350					
C2	1	100	21000521	TC40	TD-4-150	FM-1504	
C3	50	25	21000531	TC29	TD-50-25	FM-0250	
C4A	10	350	21000851	WT-700	TDL-D10-450	FMD-4510	
B	100	50			TD-100-50	MTH-5010	
C	10	350					
C5	5	350	21000481	TC62 * TC62	TD-5-350NP	MT-3512 * MT-3512	Note 1
C6	10	25	21000251	TC22	TD-10-25	FM-0210	

* Connect negative leads together.

Note 1. Non-polarized unit.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	CBS-Columbia PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	
C7	800			DD-801	831-801	DC-521	
C8	800			DD-801	831-801	DC-521	
C9	1000						
C10	2-5.5						
C11	1000						
C12	33			TCN-33	N750K-330		
C13	.8-3.5						
C14	6.8			TCZ-6R8	NP0A-6R8	ZT-5568	
C15	800			DD-801	831-801	DC-521	
C16	3.6						
C17	.8-3.5						
C18	1000						
C19	47			DD-470	831-470	UC-5447	
C20	1.5			TCZ-1R5	NP0A-1R5	ZT-5515	
C21	47			MFT-50			
C22	.8-3.5						
C23	1-4			829-4	3115-01-10	CT551	
C24	10						
C25	7.5						
C26	800			DD-801	831-801	DC-521	
C27	800						
C28	220			DD-221	811-221	UC-5322	
C29	33			TCN-33	N750K-330		
C30	800			DD-801	831-801	DC-521	
C31	800						
C32	800						
C33	800			DD-801	831-801	DC-521	
C34	.02	600	22012200	DF-203	817-02	PT612	Note 2
C35	100		23004620	D6-101	GP1K-101	UC-531	Note 3
C36	5		23001990	TCZ-4R7	NP0A-050	ZT-555	
C37	1500		23064640	DD-152	801-0015	DC-5215	
C38	390		23002190	D6-391	GP2K-391	UC-5339	
C39	1500		23064640	DD-152	801-0015	DC-5215	
C40	1500		23064640	DD-152	801-0015	DC-5215	
C41	470		23002200	D6-471	GP2K-471	UC-5347	
C42	1500		23064640	DD-152	801-0015	DC-5215	
C43	1500		23064640	DD-152	801-0015	DC-5215	
C44	680		23002220	D6-681	GP2K-681	UC-5368	
C45	1500		23064640	DD-152	801-0015	DC-5215	

CBS-COLUMBIA U22C05, U22C07, B, U22T09, B, EB, U22T19, B, U23C49, U23C59, U23T15, U23T19, 22C09, B, 22T19, B, 23C49, 23C59, 23T15, 23T19, (Ch. 921-11, -13, -14, -21, 922-7, -8)

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT.	REPLACEMENT DATA CBS-Columbia PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	NOTES
C46	1500		23046460	DD-152	801-0015	DC-5215	
C47	1500		23046460	DD-152	801-0015	DC-5215	
C48	1500		23046460	DD-152	801-0015	DC-5215	
C49	1500		23046460	DD-152	801-0015	DC-5215	
C50	1000		23002740	DS-102	GP2L-102	UC-521	
C51	.05	400	22011740	DF-503		PT415	
C52	820		23003230	DS-821	GP2K-821		
C53	.05	600	23017740	DF-503		PT415	
C54	.003	500	23012180	DS-302	GP2-333-502	PT625	
C55	1500		23046460	DD-152	801-0015	DC-5215	
C56	.05	400	22011740	DF-503		PT415	
C57	1 0	100	22010850			PT41	
C58	.05	200	22011240	DF-503		PT415	
C59	.25	300	23011330			PT6528	Note 4
C60	15		23000330	DS-150	GP1K-150	UC-5415	
C61	47		23000321	TCZ-47	GP2K-339-479	ZT-5447	
C62	2.2		23041550	TCZ-2R2	NP8A-2R2		
C63	5000		23046680	DD-502	811-005	DC-525	
C64	5000		23046680	DD-502	811-005	DC-525	Note 5
C65	.05	400	22011740	DF-503		PT415	
C66	1000		23002740	DS-102	GP2L-102	UC-521	Note 6
C67	470		23003200	DS-471	GP2K-471	UC-5347	Note 7
C68	10000		23068030	DD-103	811-02	DC-531	Note 8
C69	220		21000170	DS-221	GP2K-221	UC-5322	
C70	.05	600	23012340	DF-503		PT415	
C71	.022	200	23012300	DF-303	817-03	PT4122	
C72	.003	600	23012180	DS-302	GP3-333-302	PT623	
C73	.05	600	23012340	DF-503		PT415	
C74	.001	600	23012040	DS-102	GP2L-102	PT621	
C75	.001	600	23012040	DS-102	GP2L-102	PT621	
C76	1	100	23012380	DF-104		PT4101	
C77	.022	400	22010700	DF-303	817-02	PT4122	
C78	390	500	23003980	DS-391		MC343	
C79	270	500	23003940	DS-271		MC341	
C80	.01	600	23012160	DS-103	GP3-333-103	PT611	
C81	.01	600	23012160	DS-103	GP3-333-103	PT611	Note 2
C82	.005	600	23012120	DS-502	GP3-333-502	PT625	
C83	.01	600	23012160	DS-103	GP3-333-103	PT611	
C84	.005	600	23012120	DS-502	GP3-333-502	PT625	
C85	4700	500	23001940			MC3465	
C86	.0047	400	23016630	DS-472	GP3-333-472	PT6347	Note 5
C87	.033	600	23000621	DF-333		PT6123	
C88	.02	600	23012300	DF-303	817-03	PT6123	
C89	.1	600	23012320	DF-104		PT6103	
C90	1500		23046460	DD-153	801-0015	DC-5215	
C91	.05	600	22012340	DF-503		PT415	
C92	.05	600	23012340	DF-503		PT415	
C93	.05	600	23012340	DF-503		PT415	
C94	.001	600	23017040	DS-102	GP2L-102	PT621	
C95	.001	600	23017040	DS-102	GP2L-102	PT621	
C96	.005	600	23017020	DS-502	GP3-333-502	PT625	
C97	.005	600	23017020	DS-502	GP3-333-502	PT625	
C98	.05	600	22017740	DF-503		PT415	
C99	3900	500	23003120			MC3463	
C100	680	500	23004090	DS-681	811-081		
C101	.05	600	22017740	DF-503		PT415	
C102	390	500	23003900	DS-391	811-391	MC3243	
C103	470	500	23004000	DS-471	811-471	MC3245	
C104	22	500		DS-220	811-220	MC3230	Note 9
C105	.05	600	22017740	DF-503		PT415	
C106	.05	600	22017740	DF-503		PT415	
C107	560	2000	23000101	TY3-502	412	HV30035A	
C108	56	2500		DD30-560	3KV-560	DC30456	
C109	5000		23066680	DD-502	811-005	DC-525	
C110	2000		23065930	DF-203	817-01	PT6112	Note 10

Note 2. Not used in some versions.
Note 3. Chassis 921-11 and 921-13 use 180MMF in this application (part #23004650).
Note 4. Some versions use .047MFD in this application (part #22012240).
Note 5. Used in chassis 922-7 and 922-9.
Note 6. Chassis 922-7 and 922-8 use 470MMF in this application (part #23002200).
Note 7. Chassis 922-7 and 922-8 use 1000MMF in this application (part #23002240).
Note 8. Chassis 922-7 and 922-8 use 10000MMF in this application (part #23002740).
Note 9. Some versions use a 25-280MMF variable trimmer in this application (part #3500001U).
Note 10. Used only in chassis 922-7 and 922-8.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA CBS-Columbia PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	5000Ω	½	38000481	F1-21	RTV-393	QJ-6377	UF53R	Contrast (Panel) See Note 1
B	250KΩ	½		R2-25			UR254A	Volume (Rear) Attach to R1A.
C	Switch			KB-1			US-26	Attach to R1B.
R1A	4000Ω	½	38001391	F1-21	RTV-393	QJ-774	UF53R	Contrast (Panel) See Note 2
B	250KΩ	½		R2-25			UR254A	Volume (Rear) Attach to R1A.
C	Switch			KB-1			US-26	Attach to R1B.
R2A	100KΩ	½	38000521	AB-40	A47-100K-S	QJ1-128	U-41	Brightness
B	Shaft		Not Req.	KSS-3	Not Req.	Not Req.	Not Req.	Attach to R3A.
R3A	1Meg	½	38000531	AB-69	A47-1Meg-S	QJ1-137	U-87	Vertical Hold
B	Shaft		Not Req.	KSS-3	Not Req.	Not Req.	Not Req.	Attach to R3A.
R4A	5000Ω	½	38000541	AB-10	A47-5000-S	QJ-114	U-14	Horizontal Hold
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R4A.
R5A	1Meg	½	38000481	AB-87	A47-1Meg-S	QJ1-141	SU-67	Height
B	Shaft		Not Req.	AK-1	FKS-1/4	Not Req.	Not Req.	Attach to R5A.
R6A	5000Ω	2	38000581	WK-135	A43-5000	WK-9000	RS8001L	Vertical Linearity (Wire Wound)
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R6A.
R7A	1Meg	½	38000421	AB-87	A47-1Meg-S	QJ1-141	SU-67	Local-Distance-See Note 3
B	Shaft		Not Req.	AK-1	FKS-1/4	Not Req.	Not Req.	Attach to R7A.

Note 1. Used in chassis 921-11, 921-13, 921-14, 921-21.
Note 2. Used in chassis 923-7, 923-8.
Note 3. Not used in some versions.
†CONCENTRIKIT EQUIVALENT, K-4 KIT, BASE ELEMENTS AND SHAFTS, B17-114, P1-118 (Panel)
B12-130, R14-304 (Rear)
76-1 (Switch)
•CONCENTRIKIT EQUIVALENT, K-3 KIT, BASE ELEMENTS AND SHAFTS, B17-114, P1-118 (Panel)
B12-130, R9-305 (Rear)
76-1 (Switch)
♦ Universal Replacement (Mallory Exact Duplicate Part No. UE5703)

RESISTORS

ITEM No	RATING OHMS	RATING WATT	REPLACEMENT DATA CBS-Columbia PART No	IRC PART No	NOTES
R5	82000Ω	½	30822230	BTS-8200	
R9	22000			BTA-2200	
R10	47KΩ		30473230	BTS-47K	
R11	33KΩ		30333230	BTS-33K	
R12	370KΩ		30374230	BTS-370K	
R13	180KΩ		30184230	BTS-180K	
R14	8800			BTS-880	
R15	1000Ω		30102230	BTA-1000	
R16	10KΩ		30103230	BTS-10K	
R17	150KΩ			BTS-150K	
R18	3300Ω		30332240		
R19	15KΩ		30153230	BTS-15K	
R20	100KΩ		30104230		
R21	2000Ω		30202230		
R22	200Ω		30622230		
R23	100KΩ		30104230		
R24	1000Ω		30102240	BTA-1000	Note 1
R25	3900Ω		30392230	BTS-3900	
R26	1.5Meg		30185230	BTS-1.5Meg	Note 2
R27	330Ω		30331230	BTS-330	
R28	10KΩ		30103230		
R29	1000Ω		30102240	BTA-1000	
R30	47Ω		30470230	BTS-47	
R31	470KΩ		30474230	BTS-470K	
R33	18KΩ		30183230		
R34	1000Ω		30102240	BTA-1000	
R35	47KΩ		30473230	BTS-47K	
R36	180KΩ		30183230	BTS-180K	Note 3
R37	470KΩ		30474230	BTS-470K	
R38	18KΩ		30183230	BTS-18K	Note 4
R39	470Ω		30470230	BTS-470	
R40	15KΩ		30153230	BTS-15K	
R41	270KΩ		30274230	BTS-270K	
R42	39KΩ		30393230	BTS-39K	
R43	470KΩ		30474230	BTS-470K	
R44	3300Ω		30332240	BTA-3300	
R45	220Ω		30221230	BTS-220	
R46	1Meg		30105230	BTS-1Meg	
R47	27KΩ		30273230	BTS-27K	
R48	11KΩ 5%	2	30113150	BTB-11K 5%	
R49	18KΩ	2	30183250	BTB-18K	
R50	100Ω		30101230	BTS-100	
R51	33KΩ		30333230	BTS-33K	
R52	1Meg		30105230	BTS-1Meg	
R53	2.2Meg		30225230	BTS-2.2Meg	
R54	370KΩ		30374230	BTS-370K	
R55	180KΩ		30184230	BTS-180K	Note 5
R56	2200Ω		30222230	BTS-2200	
R57	33KΩ		30333230	BTS-33K	
R58	33KΩ		30333230	BTS-33K	
R59	100KΩ		30104230	BTS-100K	Note 6
R60	100KΩ		30104230	BTS-100K	Note 6
R61	56KΩ		30563230	BTS-56K	
R62	100KΩ		30104230	BTS-100K	
R63	1800Ω		30182230	BTS-1800	Note 7
R64	68Ω		30680230	BTS-68	
R65	39KΩ		30393230	BTS-39K	
R66	560KΩ		30564230	BTS-560K	Note 8
R67	27KΩ		30273230	BTS-27K	
R68	10Meg		30106230	BTS-10Meg	
R69	560KΩ		30564230	BTS 560K	
R70	470KΩ		30474230	BTS-470K	
R71	560Ω		30561230	BTS-560	
R72	82Ω		30821230	BTS-820	
R73	470KΩ		30474230	BTS-470K	
R74	150Ω	1	31000101	PW4-150	
R75	33Ω		3033z240	BTA-330	
R76	12KΩ		30123230	BTS-12K	
R77	470KΩ		30474230	BTS-470K	
R78	2.2Meg		30225230	BTS-2.2Meg	
R79	15KΩ		30153230	BTS-15K	
R80	2.2Meg		30225230	BTS-2.2Meg	
R81	22KΩ		30223230	BTA-22K	Note 9
R82	1Meg		30105230	BTS-1Meg	
R83	1Meg		30105230	BTS-1Meg	
R84	22KΩ		30223230	BTS-22K	
R85	3900Ω		30392230	BTS-3900	
R86	3900Ω		30392230	BTS-3900	
R87	2700Ω		30272230	BTS-2700	
R88	22KΩ		30223230	BTS-22K	
R89	22KΩ		30223230	BTS-22K	
R90	8200Ω		30822230	BTS-8200	
R91	100KΩ		30104230	BTS-100K	
R92	1.5Meg 5%			BTA-1.5Meg5%	Note 10, 11
R93	6800Ω		30682230	BTS-6800	
R94	470KΩ		30474230	BTS-470K	
R95	47KΩ		30473230	BTS-47K	
R96	2.2Meg		30225230	BTS-2.2Meg	
R97	5600Ω	2	30562250	BTB-5600	
R98	1200Ω		30122230	BTS-1200	
R99	8800				Note 12
R100	560Ω				Note 13
R101	100KΩ		30104230		
R102	27KΩ		30273240		
R103	100KΩ		30104230		
R104	2.2Meg		30225230		
R105	470KΩ		30474230	BTS-470K	
R106	6800Ω		30682230	BTS-6800	
R107	5600Ω	2	30056250		
R108	370KΩ		30374230	BTS-370K	
R109	100KΩ		30104230		
R110	15KΩ		30153230		
R111	1000Ω		30102240	BTA-1000	
R112	27KΩ 5%	1	30273240		
R113	470KΩ		30474230	BTS-470K	
R114	82Ω		30820230		
R115	5600Ω		30562230	BTB-5600	
R116	150	3	30151250		
R117	470Ω		30471230		
R118	1.5Ω		30000041		
R119	1Meg	2	30105250	BTB-1Meg	
R120	9000Ω	5	31000095	1 3/4A-9000	
R121	18KΩ	2	30183250	BTB-18K	
R122	1.2Ω	1	30000048	BW1-1.2	
R123	40Ω	10	31000068	1 3/4A-40	
R124	27Ω		30270230	BTS-27	Note 1
R125	220KΩ		30224240	BTA-220K	
R126	47Ω		30470230	BTS-47	Note 14
R127	10KΩ		30103230		Note 15

Note 1. Not used in some versions.
Note 2. Some versions use a 1.5Meg ½W resistor in this application when local-distance cont. is not used. (Mfgr. Part No. 30515130)
Note 3. A 18KΩ ½W resistor is used in chassis 922-7 and 923-8. (Mfgr Part No. 30123230)
Note 4. Some versions use a 27KΩ ½W resistor in this application.
Note 5. A 470KΩ ½W resistor is used in chassis 922-7 and 922-8. (Mfgr. Part No. 30474230)
Note 6. A 150KΩ ½W resistor is used in chassis 922-7 and 922-8. (Mfgr. Part No. 30154230)
Note 7. A 470Ω ½W resistor is used in chassis 922-7 and 923-8. (Mfgr. Part No. 30471230)
Note 8. A 56KΩ ½W resistor is used in chassis 922-7 and 923-8. (Mfgr. Part No. 30563230)
Note 9. A 33KΩ ½W resistor is used in chassis 923-7 and 922-8. (Mfgr. Part No. 30333240)
Note 10. A 82KΩ ½W resistor is used in chassis 923-7 and 922-8. (Mfgr. Part No. 30824240)
Note 11. Some versions use a 2.2Meg ½W resistor in this application. (Mfgr. Part No. 30225140)
Note 12. A 2300Ω ½W resistor is used in chassis 923-7 and 922-8.
Note 13. Some versions use a 22KΩ ½W resistor in this application.
Note 14. Used in chassis 923-7 and 922-8.
Note 15. Used in chassis 922-7 and 923-8 only.

TRANSFORMER (POWER)

ITEM No	RATING			REPLACEMENT DATA CBS-Columbia PART No	Hallporson PART No	Merit PART No	RCA TYPE No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
	PRI	SEC 1	SEC 2								
T1	117VAC	575VCT	5VAC	10000571		P-3055		P-8335			
	@1.68A	.330ADC	@3A	10000411 ①							
	SEC 3	SEC 4	SEC 5								
	6.3VAC	6.3VAC									
	@.2A	@.8.1A									

① Alternate power trans.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA CBS-Columbia PART No	Hallporson PART No	Merit PART No	RCA TYPE No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T2	Vert. Osc. Trans.	10000063	B8702	A-3003	209T1	V405	A-8125	26A03	A-97X
T3	Horiz. Output Trans.	12000751 ②	FB440*	HVO-41*	232T1*	SX-04*	A-8284*	FLY-38*	D-35*
		12000101 ④							
T4	Vert. Output Trans.	10000022		A-2424 ⑬		V313 ⑭	A-8123 ⑫	26S52 ⑭	A-109X ⑫
T5A	Yoke Horiz. (23MH)	18000542 ③	DF805 ③	MDF-75 ③	222D1 ③		Y70F20/43 ③	DY-11A ③	Y-10 ③
B	Vert. (42MH)	18001381 ④	DF805 ④	MDF-75 ④	222D1 ④		Y70F20/43 ④	DY-11A ④	Y-10 ④
T6	Horiz. Lin. Coil (3.8-17.5MH)	18000201	RF800 ⑤	MWC-12	215R1	201R6	WC-5 ⑩	WC-18 ⑤	WC-12 ⑤
T7	Width Coil(1.2 to 3.4MH)	18001111		MWC-5 ⑤	204R1	201R13A	WC- 8	WC-17	WC-12 ⑪

① Drill new mounting hole(s).
② Used in chassis 921-21, 921-11, 921-13, & 921-14.
③ Alternate CBS-Columbia Part Number.
④ Used in chassis 922-7 & 922-8.
⑤ Use original horizontal damping network.
⑥ Refer to instructions packed with unit, pertaining to horizontal damping network.
⑦ Use original yoke damping network.
⑧ Enlarge mounting hole.
⑨ Connect to terminals #1 & #2.
⑩ Connect to coded red & blue terminals.
⑪ Connect to coded blue & green terminals.
⑫ Connect as auto trans.
⑬ Use 15 to 1 turns ratio.
⑭ Cut & tape yellow lead.
* Available on special order only.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Hallporson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	3 3	HV Rect Lead	HV Rect. Lead	HV Rect Lead		HV Rect Lead	HV Rect Lead	HV Rect. Lead
	9 9	Horiz. Out. Tube Lead	6	10		6	3 10	10
	7 7	10 & 11	5	8		5	Jumper #7 & #10	8
	2&4 NC	NC	NC	NC		NC	NC	NC
	8 8	5	3	5		3	7	5
	1 1	1	1	3		1	4	3*
	6 6	7	A	2		A	AGC Wind	2
	5 5	8	G	1		G	AGC Wind.	1
Connect Width Coil Across	5&6	5&6	A & G	1 & 2		A & G	5 & 4	2 & 1
Special Notes	⑮ ⑱					⑱	⑱	

⑮ If the picture is out of phase, reverse AGC winding.
⑱ Jumper terminals #9 & #7.
⑰ Connections for part #12000751 and 12000151
⑱ Connections for part #12000101

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI	IMPEDANCE SEC	REPLACEMENT DATA CBS-Columbia PART No	Hallporson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T8	4.6KΩ	3.4Ω	Part of Spkr	Z1107	A-2930	A-3877	24S51	S-3X	

SPEAKER

ITEM No	RATINGS SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA CBS-Columbia PART No.	QUAM PART No.	NOTES
SP1	5"	PM	3.4Ω	73000481 ①	5A1	① Used in Models U22C97, U22C97B, 23C09, and 22C09B.
	6"	PM	3.4Ω	73000481 ②	6A1	② Used in Models U23C49, U23C69, 23C49, 23C59.
	6"	PM	3.4Ω	73000171 ③	6A1	③ Used in Models U23C05, U23T09, U23T09B, and U22T09EB.
	6"	PM	3.4Ω	73000433 ④	6A1	
	5"	PM	3.4Ω	73000851 ④	5A1	④ Used in Models U23T15, 23T15, 23T19, U23T15.
	5"	PM	3.4Ω	73000231 ⑤	5A1	
	8"	PM	3.4Ω	73000231 ⑤	8A1	⑤ Used in Models U23T19, U22T19B, 23T19, 22T19B, U23T19, and 22T19.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI	DC RES. SEC	REPLACEMENT DATA CBS-Columbia PART No.	MEISSNER PART No	MERIT PART No	MILLER PART No	NOTES
L1	UHF Ant. Coil	OOCT						
L2	FIL Choke	0Ω						
L3	FIL Choke	0Ω						
L4	Cathode Choke	0Ω						
L5	UHF Osc. Coil	0Ω						
L6	UHF Osc. Coupling Coil	0Ω						
L7	UHF IF Coil	0Ω						Tapped
L8A	VHF Ant. Coil	OOCT	0Ω					
B	UHF IF Strip							Includes 100MMF capacitor
L9	Neut. Coil	0Ω						
L10A	VHF RF Mixer Grid Osc. Coil	0Ω						
B	UHF IF Strip	0Ω	0Ω					Includes 5. 6KΩ resistor
L11	FIL Choke	0Ω						
L12	Conv. Plate	.1Ω						
L13	1st Video IF	0Ω		12000341	17-5000*	TV-125*	6231*	
L14	2nd Video IF	.7Ω	.9Ω	12000771	17-5003	TV-127	6232	Includes 41. 25MC Trap
L15	FIL Choke	0Ω		18000281	19-1005		4621	8.2 Microhenries
L16	3rd Video IF	.1Ω	0Ω	12000781	17-4521*	TV-128	6233	Includes 47. 25MC Trap
L17	FIL Choke	0Ω		18000151	19-1005		4621	8.2 Microhenries
L18	4th Video IF	.3Ω	.3Ω	12000801	17-5002*		6234*	Includes 39. 75MC Trap

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA CBS-Columbia PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L19	Series Peaking Coil	1Ω		18000055	19-3300	TV-190	6155	340 Microhenries
L20	Shunt Peaking Coil	1Ω		18000056	19-3250	TV-185	6151	269 Microhenries
L21	Series Peaking Coil	7.5Ω		18000041	19-3125		6153	118 Microhenries
L22	Shunt Peaking Coil	7.5Ω		18000041	19-3125		6153	118 Microhenries
L23	Series Peaking Coil	9.5Ω		18000042	19-3150	TV-184	6150	172 Microhenries
L24	Shunt Peaking Coil	10.5Ω		18000044	19-4400	TV-190	4648	380 Microhenries
L25	Sound IF	6.5Ω		18000481	17-3496*	TV-115*	1470A	
L26	Ratio Det.	6.3Ω	2.6OCT	13000201	17-3497	TV-115	6305	Tertiary Winding=1.5Ω
L27	Horiz. Osc.	65Ω		18000111	19-1576	TV-163	6210	

*Use one winding.
■Drill mounting holes.
▲Retune

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 (°L)	REPLACEMENT DATA CBS-Columbia PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Tried PART No
L28	230ADC	70Ω	3.35HY	14000021	C5037 ①	C-2991 ①	C-2325 ①	26C44	C-21X

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA CBS-Columbia PART No. FUSE	CBS-Columbia PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG FT S/B	1A 125V	43000040*		315.500 (3AG P/T S/B 8A)		MDV1	

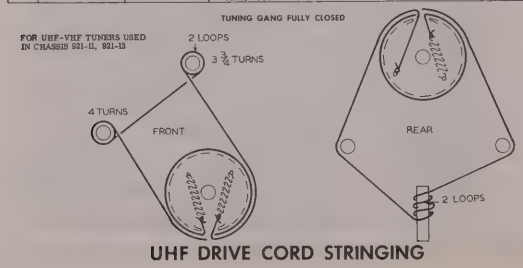
*Used in chassis 922-7, 923-8, 921-21; chassis 921-11, 921-13, 921-14 use fuse part #4300002L

CRYSTAL DIODES

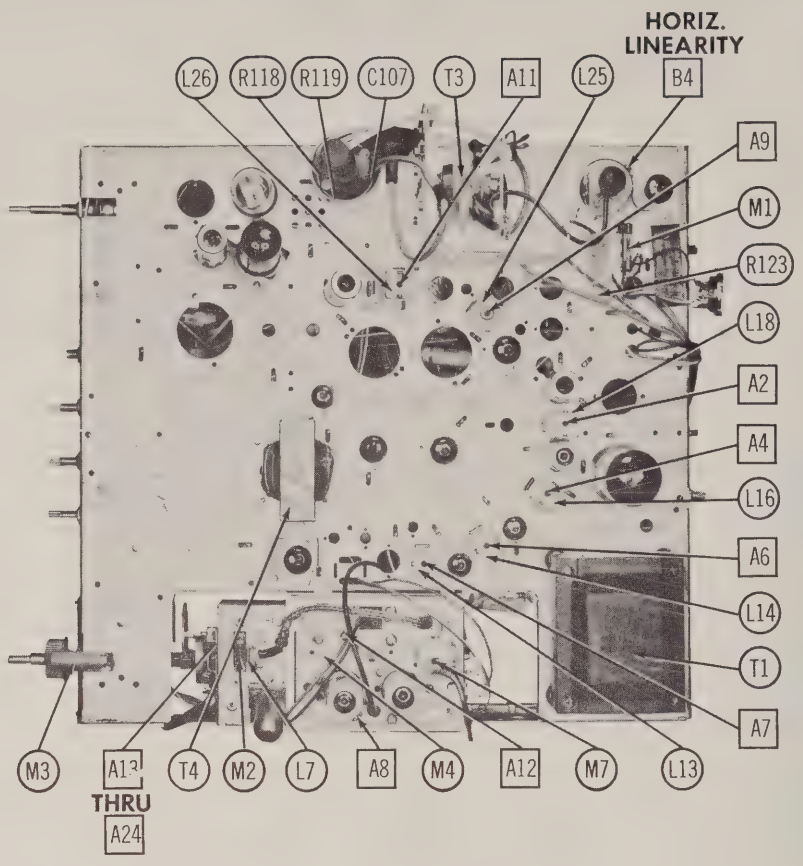
ITEM No.	ORIG. TYPE	REPLACEMENT DATA CBS-Columbia PART No.	SYLVANIA PART No.	NOTES
M2	1N82A		1N82 or 1N82A	UHF Mixer

MISCELLANEOUS

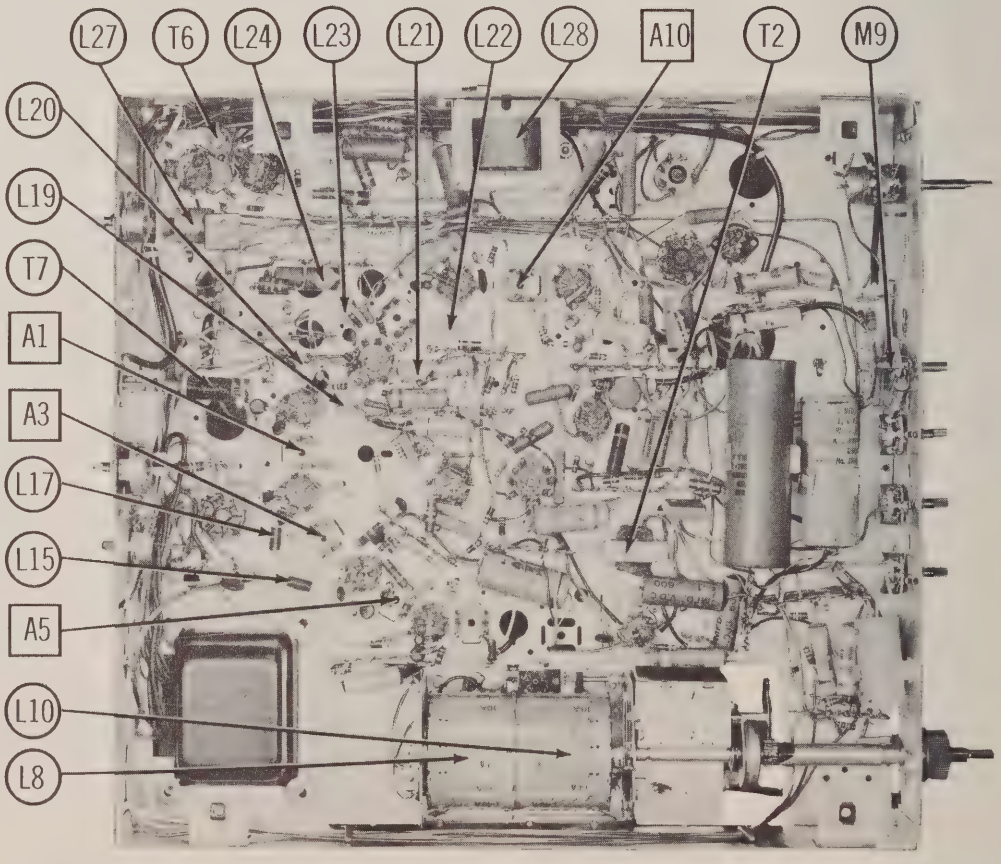
ITEM No.	PART NAME	CBS-Columbia PART No.	NOTES
M3	Dial Light	64000011	#47 - Used in chassis 922-7, 921-21, 921-11, 921-13
M4	Tuner	69000611	VHF-UHF combination - Chassis 922-7, 921-21
M5	Tuner	69000591	VHF - Used in chassis 921-14 and in some versions of chassis 922-8
	Tuner	69000181	VHF - chassis 921-11, 921-13
	Tuner	69000661	VHF - used in some versions of chassis 922-8
M6	Tuner	69000171	UHF - Chassis 921-11, 921-13
M7	Trap	83A64817	VHF Ant. Input Filter - Used in chassis 922-7, 921-21 and in some versions of chassis 922-8
	Trap		VHF ant. input filter - Used in chassis 921-14 and in some versions of chassis 922-8
M8	Switch		VHF-UHF - Chassis 921-11, 921-13
M9	Switch	40000261	Voice-music-phono (Rotary-wafer type)
M10	Focus Magnet	19000101	Includes centering device
M11	Ion Trap	19000181	
B2	Trimmer Cap.	25000011	Horiz. Drive (25-280MMF) Not used in some versions.
	Safety Glass	77000256	Models U22C05, U23C07, U22C07B, U22T09, U22T09B, U22T09EB, U22T19, U22T19B, 23T19, 22T19B
	Safety Glass	77000255	Models 23C09, 22C09B
	Safety Glass	77000431	Models U23T19, U23T15, U23C49, U23C59, 23T19, 23T15, 23C49, 23C59
	Mask	71000921	Models U22C05, U23C07, U22C07B
	Mask	71000922	Models U22T19, U22T19B, 22T19, 22T19B
	Mask	71001132	Models 22C09, 22C09B
	Mask	71001303	Models U23T19, U23T15, U23C49, U23C59, 23T19, 23T15, 23C49, 23C59



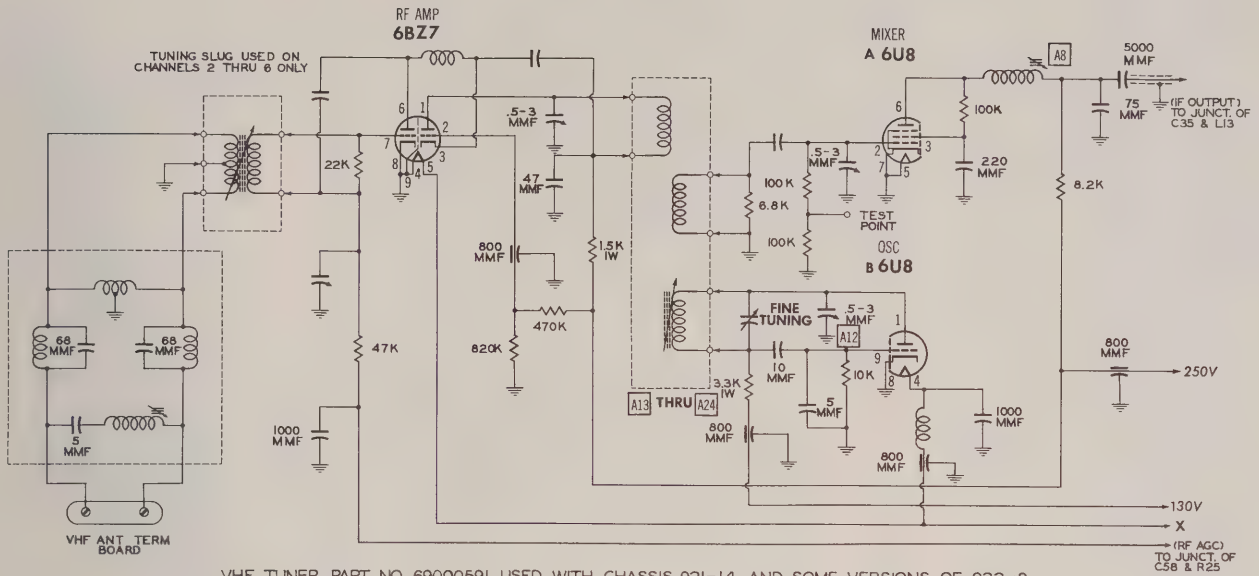
UHF DRIVE CORD STRINGING



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



VHF TUNER PART NO. 6900059I USED WITH CHASSIS 921-14, AND SOME VERSIONS OF 922-8

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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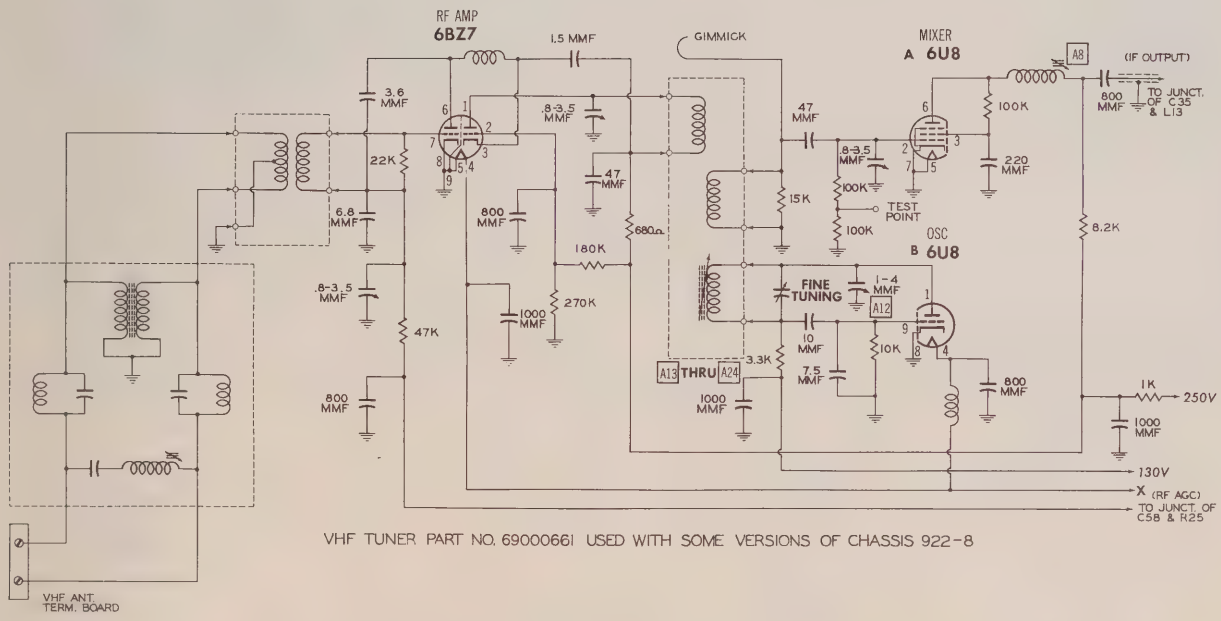
ALTERNATE VHF TUNER SCHEMATIC



VHF TUNER PART NO. 6900066I USED WITH SOME VERSIONS OF CHASSIS 922-8

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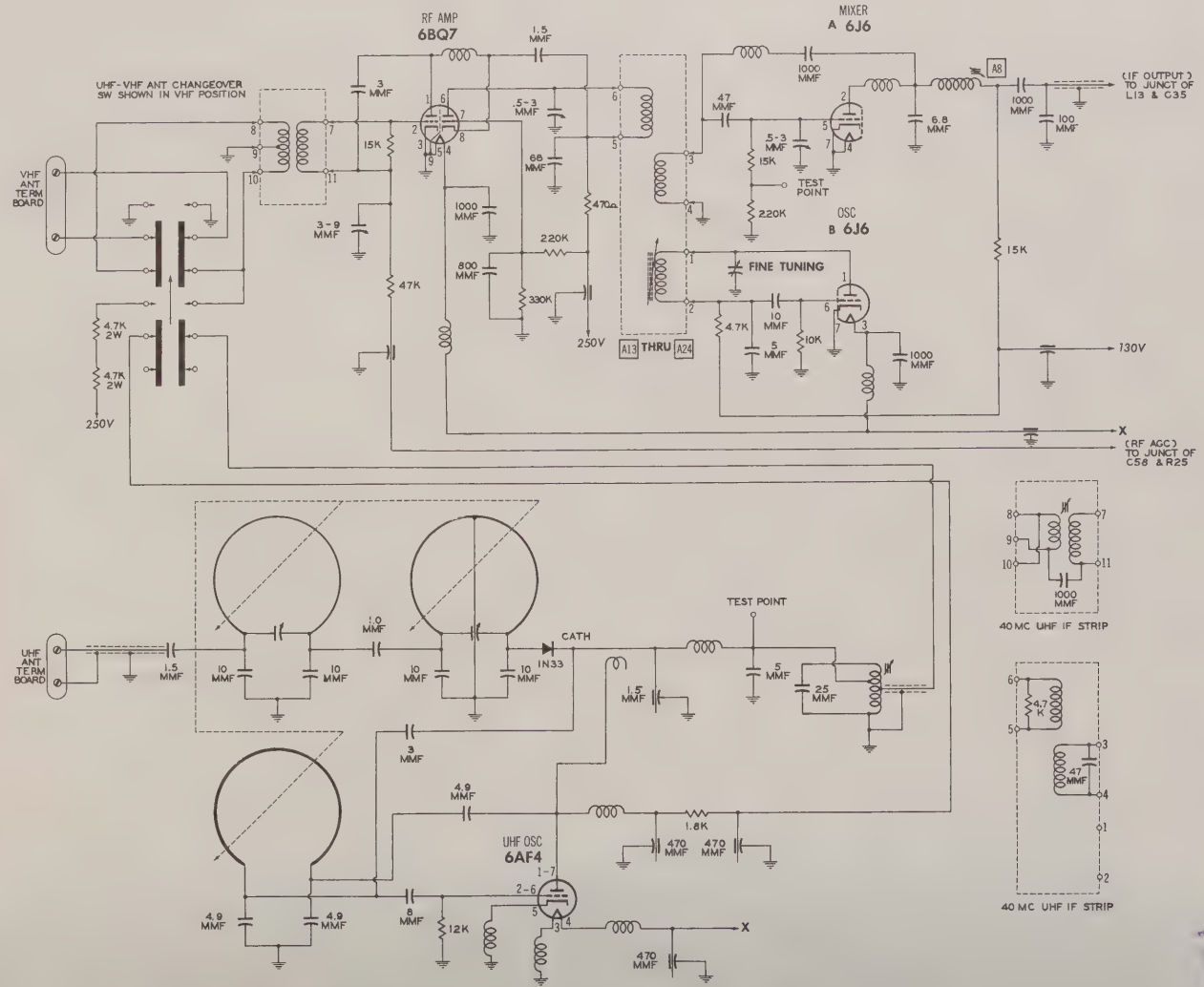
ALTERNATE VHF TUNER SCHEMATIC



UHF TUNER PART NO. 6900017I, AND VHF TUNER PART NO. 6900018I USED WITH CHASSIS 921-11, AND 921-13

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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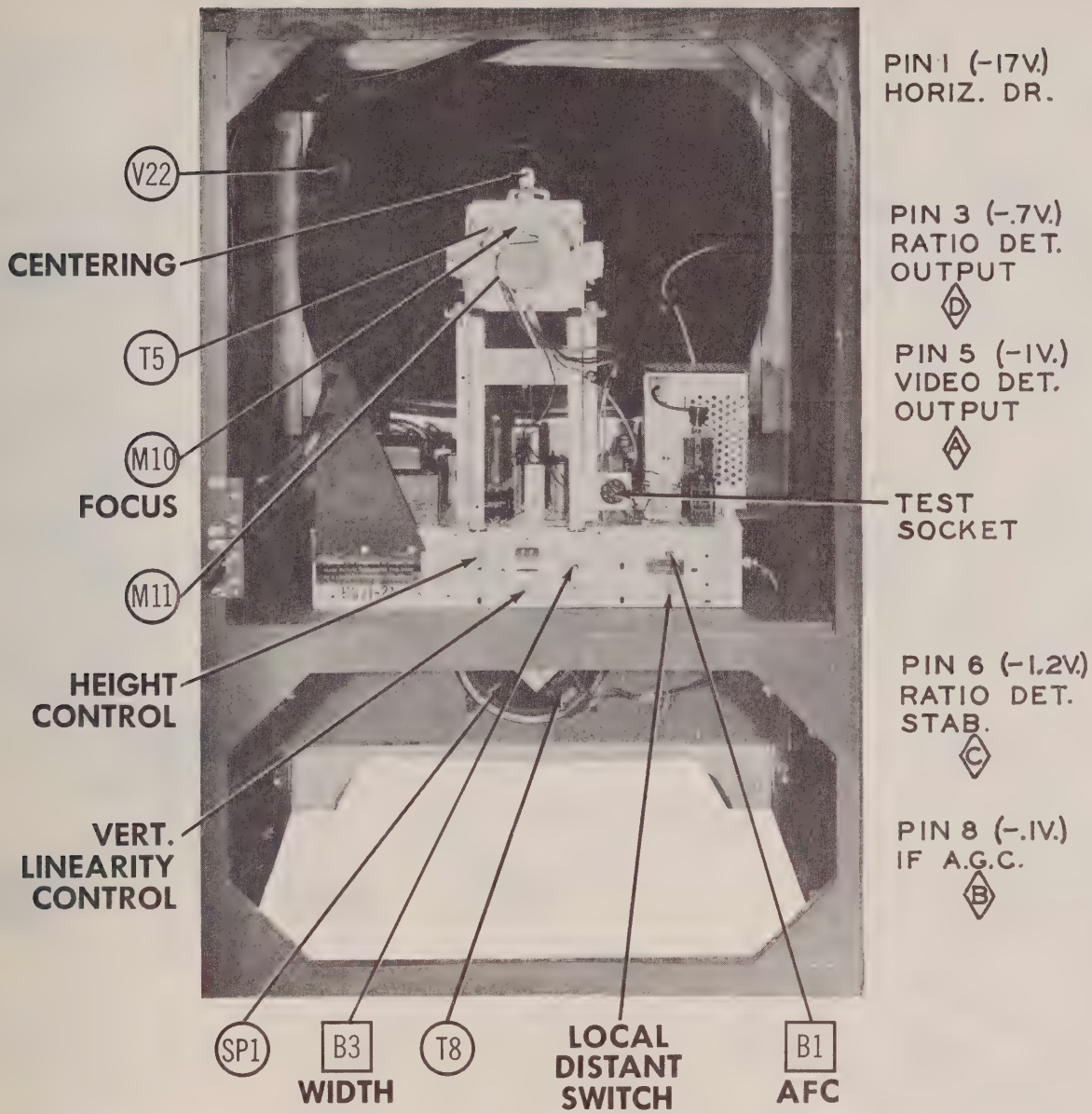
ALTERNATE VHF-UHF TUNER SCHEMATIC



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

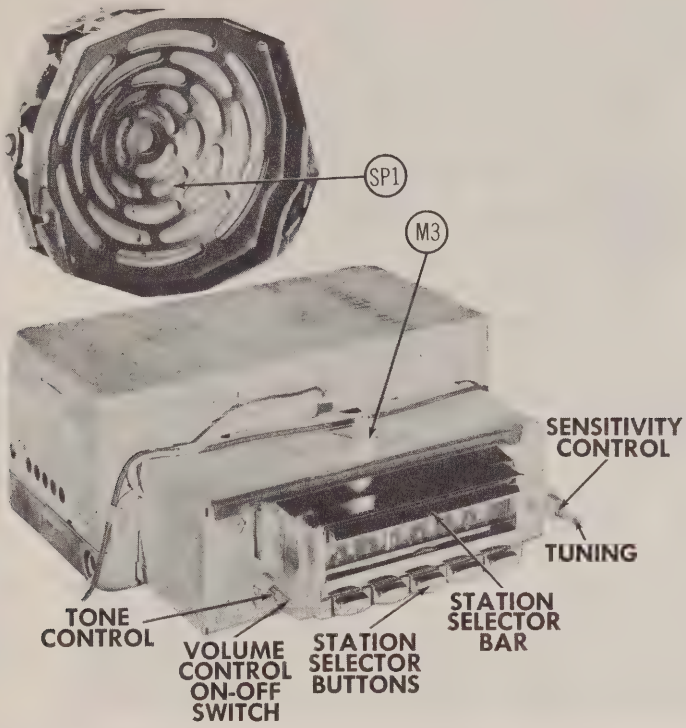
Set the horizontal hold control to its mid-range position and adjust the horizontal AFC slug (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B2) in a counter clockwise position as far as possible without the presence of vertical white lines or compression near the center of the picture.

Adjust the width slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.

CHEVROLET MODEL 3711897



TRADE NAME	Chevrolet Model 3711897 (For 1955 Chevrolet "Corvette" Cars
SUPPLIER	Chevrolet Motor Div., General Motors Corp., Detroit, Michigan
TYPE SET	Battery Operated Custom Built AM Superheterodyne Automobile Receiver
TUBES (Nine)	Types: 12BA6 RF Amp., 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det.-AF Amp., 12AV6 Phase Inv.-AVC, (2) 12V6GT Output, 12AU7 Trigger, 0Z4 Rectifier
POWER SUPPLY	12 Volt Storage Battery — RATING 3.4 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540KC-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to chassis.	260KC	High freq. end stop	Between point A and chassis.	A1, A2, A3	Adjust for maximum output.
2.	"	"	"	"	"	A4	Adjust for MINIMUM output.
3.	180MMF	High side to antenna receptacle. Low side to chassis.	1615KC	"	"	*A5, A6, A7	Adjust for maximum output.
4.	"	"	600KC	Tune to 600KC signal	"	A9, A10	"
5.	"	"	1615KC	Tune to 1615KC signal	"	A6, A7	"
6.	"	"	1000KC	Tune to 1000KC signal	"		Adjust if necessary, pointer adjustment screw so pointer reads 1000KC. With receiver installed and antenna fully extended, tune to weak station between 600KC and 1000KC. Adjust A7 for maximum volume.

* Check oscillator core setting (A8). Rear of core should be 1 25/32" from mounting end of coil form.

PUSHBUTTON ADJUSTMENT

Open hinged door below dial exposing selector tabs, tune to desired frequency starting at left side of dial, move first selector tab to correspond with pointer, and repeat on remaining tabs . Work toward right end of dial.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		CHEVROLET PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	12BA6	12BA6	7BK	
V2	Converter	12BE6	12BE6	7CH	
V3	IF Amplifier	12BA6	12BA6	7BK	
V4	Det.-AF Amp.	12AV6	12AV6	7BT	
V5	Phase Inv.-AVC	12AV6	12AV6	7BT	
V6	Audio Output	12V6GT	12V6GT	7AC	
V7	Audio Output	12V6GT	12V6GT	7AC	
V8	Trigger	12AU7	12AU7	9A	
V9	Rectifier	0Z4	0Z4	4R	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	CHEVROLET PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	
C2	.05	200	6512	DF-503		PT415	
C3	.1	400	6513	DF-104		PT401	
C4	.05	200	6512	DF-503		PT415	
C5	68	500	G-680	TCZ-68	NP0-337-680	MCL468	
C6	39	500	G-390	TCZ-39	NP0L-390	MCE223	
C7	260		7257567				
C8	.001	600	6527	D6-102	GP2L-102	PT621	
C9	.1	200	6590	DF-104		PT401	
C10	100	500	1219498	TCZ-100	NP0-337-101	MCE235	
C11	100	500	1219498	TCZ-100	NP0-337-101	MCE235	
C12	.002	600	6528	D6-202	GP2-333-202	PT622	
C13	100	500	G-101	TCZ-100	NP0-337-101	MCB235	
C14	.0025	400	7240578	D6-252	GP2-333-252	PT6222	
C15	.001	600	6527	D6-102	GP2L-102	PT621	
C16	.001	600	6527	D6-102	GP2L-102	PT621	
C17	.01	600	6533	D6-103	GP3-333-103	PT611	
C18	.005	600	6531	D6-502	GP2-333-502	PT625	
C19	.015	600	7237719	DD16-153		PT6115	
C20	.006	800	H-602	DD16-602		PT1626	
C21	.002	600	6528	D6-202	GP2-333-202	PT622	
C22	.007	1600	H-702	DD16-702		PT1627	
C23	.47	100	6592			RF480	
C24	.47	100	6592			RF480	
C25	.5	200	6592			RF480	

ELECTROLYTIC CAPACITORS

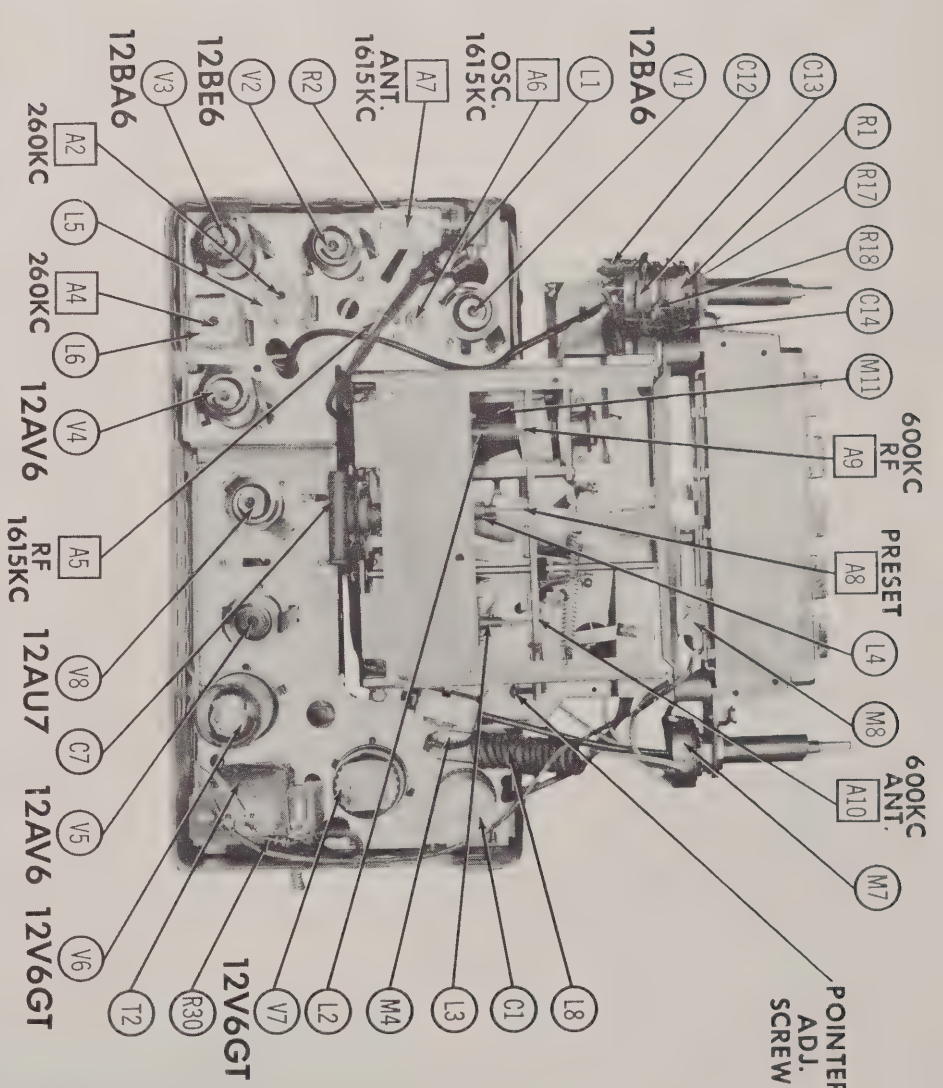
ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	CHEVROLET PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	■20	400	M-908	FP345.8	TM-3036	T-550	
B	▲20	400					
C	20	25					

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CHEVROLET PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2.5Meg	½	7265569			QJ-846A ♦		Tone - Panel
B	1Meg	½						Volume & Switch-rear - tap @ 250KΩ

♦ CONCENTRIKIT EQUIVALENT: K-8 KIT, BASE ELEMENTS & SHAFT: B13-140, P14-130 (Panel)
B13-137X, R1-210 (Rear)
S-27 (BUSHING)
76-2 (SWITCH)

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA CHEVROLET PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R2	220KΩ	½	1227	BTS-220K	
R3	2.2Meg	½	1239	BTS-2.2Meg	
R4	10KΩ	1	1174	BTA-10K	
R5	100Ω	½	1113	BTS-100	
R6	1.5Meg	½	1237	BTS-1.5Meg	
R7	330KΩ	½	1229	BTS-330K	
R8	22KΩ	½	1215	BTS-22K	
R9	12KΩ	2	1276	BTB-12K	
R10	6.8Meg	½	1245	BTS-6.8Meg	
R11	2.2Meg	½	1239	BTS-2.2Meg	
R12	10Ω	½	1101	BTS-10	
R13	150Ω	½	1115	BTS-150	
R14	15KΩ	1	1213	BTA-15K	
R15	3.3Meg	½	1241	BTS-3.3Meg	
R16	47KΩ	½	1219	BTS-47K	
R17	1.5Meg 5%	½	1219492	BTS-1.5Meg 5%	
R18	180KΩ	½	1226	BTS-180K	
R19	220KΩ	½	1227	BTS-220K	
R20	68KΩ	1	1261	BTA-68K	
R21	6.8Meg	½	1245	BTS-6.8Meg	
R22	56KΩ 5%	1	1220213	BTA-56K	
R23	220KΩ	½	1227	BTS-220K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA CHEVROLET PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R24	3300Ω	½	1131	BTS-3300	
R25	220KΩ	½	1227	BTS-220K	
R26	220KΩ	½	1227	BTS-220K	
R27	100KΩ	½	1223	BTS-100K	
R28	1800Ω	2		BTB-1800	
R29	360Ω 5%	1	7234563	BW1-360 5%	
R30	3300Ω	½	1131	BTS-3300	
R31	390Ω	½	1120	BTS-390	
R32	47KΩ 5%	1	1220188	BTA-47K 5%	
R33	120KΩ	½	1224	BTS-120K	
R34	12KΩ	1	1252	BTA-12K	
R35	47KΩ	1	1259	BTA-47K	
R36	1Meg 5%	½	1220169	BTS-1Meg 5%	
R37	1.5Meg 5%	½	1219492	BTS-1.5Meg 5%	
R38	3.3Meg	½	1241	BTS-3.3Meg	
R39	1000Ω 5%	½	1220176	BTS-1000 5%	
R40	6800Ω	1	1172	BTA-6800	
R41	1000Ω	½	1125	BTS-1000	
R42	560Ω	½	1122	BTS-560	
R43	2200Ω	½	1129	BTS-2200	
R44	15KΩ	1	1253	BTA-15K	

TRANSFORMER (VIBRATOR)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA CHEVROLET PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	12.6VCT @1.8A	550VCT .062A			6067		P-2861	P-6489	22R52	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA CHEVROLET PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	7.9KΩ CT	3.9Ω	6063	Z1007 ①	A-2936 ①	A-3852 ①	22S56 ①	S-15X ①	① Fabricate mounting.

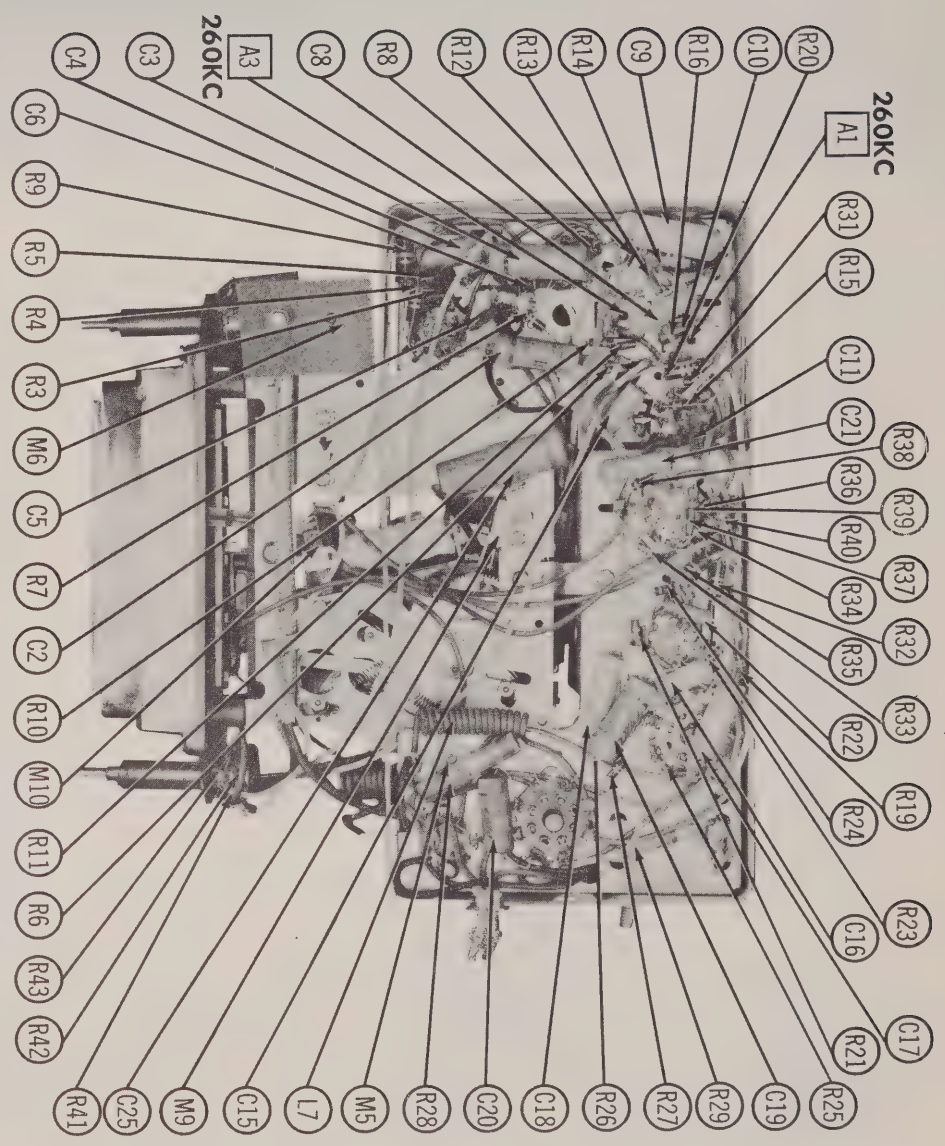
SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA CHEVROLET PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	8"	PM	3.9Ω	6105	8A21	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA CHEVROLET PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coupling Coil	.8Ω		7255738	19-1004		4610	7 Microhenries
L2	Ant. Coil	10.5Ω		7257979				
L3	RF Coil	10.5Ω		7257979				
L4	Osc. Coil	1.1Ω	4.4Ω	7263287				
L5	Input IF	40Ω	40Ω	1219508	16-6752	BC-350	12-H1	
L6	Output IF	34Ω	34Ω	1220204	16-6754	BC-354	12-H6	
L7	Fil. Choke	0Ω		1217846	19-4215		5221	1.4 Microhenries
L8	Fil. Choke	0Ω		1217846	19-4215		5221	1.4 Microhenries
L9	Vib. Hash Choke	.2Ω		1220683				212 Microhenries

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				CHEVROLET PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	12.6V	115∿	7265528	6330	G874/G883	6330	

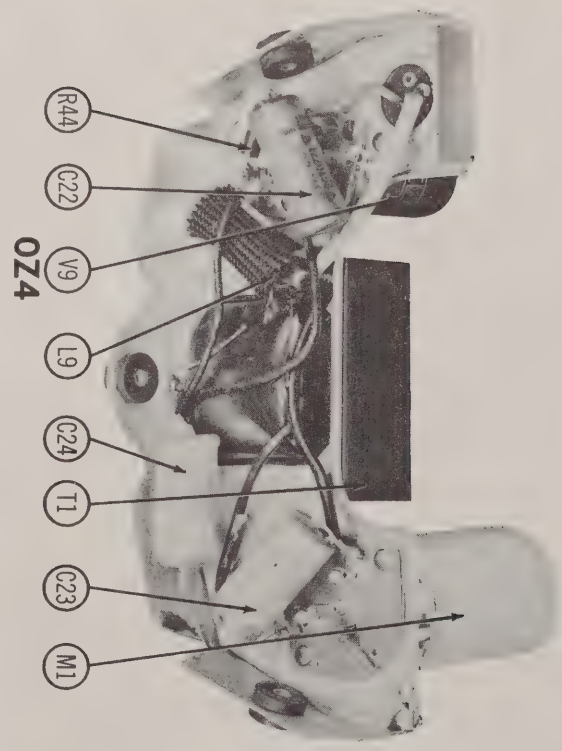
FUSES

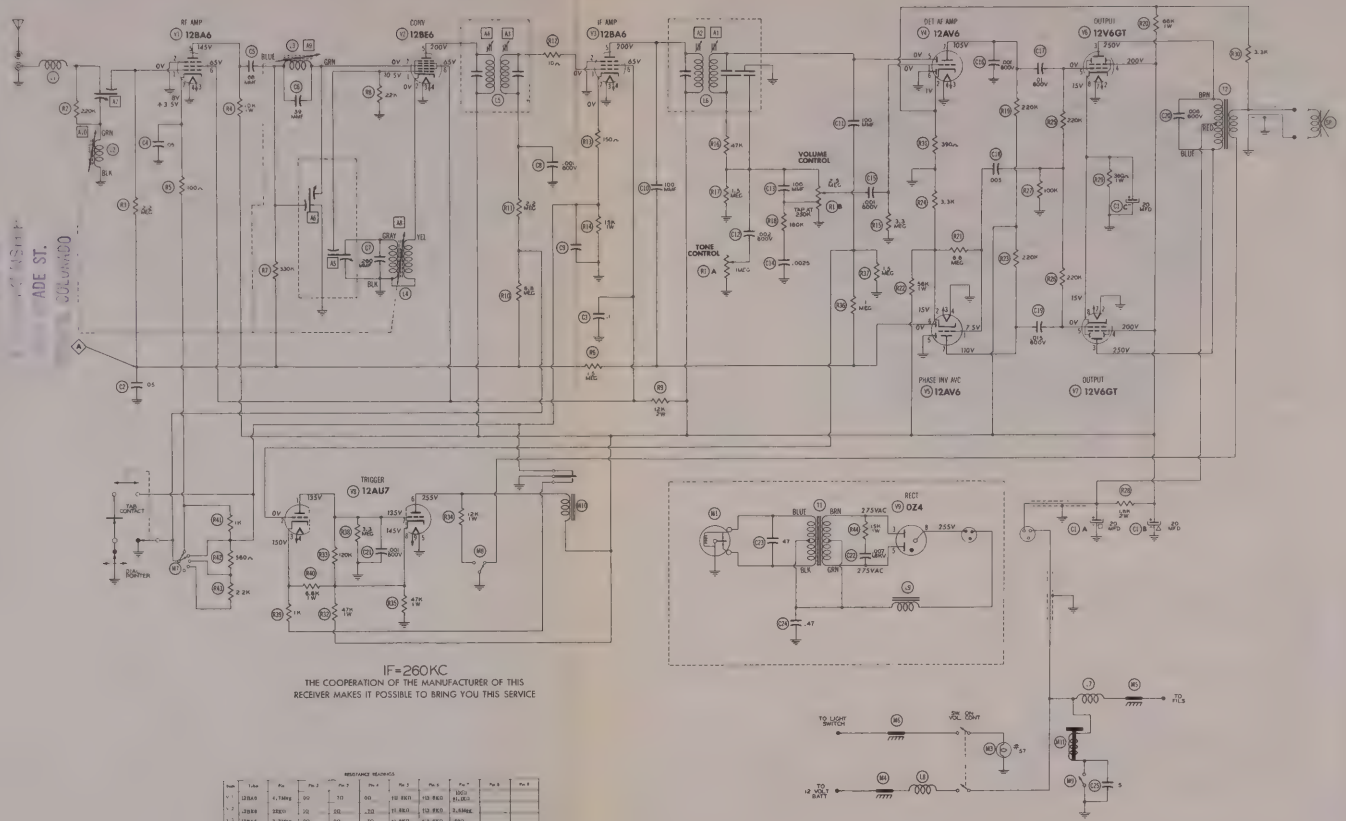
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			CHEVROLET PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	7½A	455640		30307.5 (SFE 7½A)		SFE 7½	

MISCELLANEOUS

ITEM No.	PART NAME	CHEVROLET PART No.	NOTES
M3	Dial Light		#57
M4	Spark Plate	1212278	"A" Lead
M5	Spark Plate	1217848	Filament
M6	Spark Plate	7262937	Dial Light
M7	Switch	7265570	Sensitivity
M8	Switch	7263912	Station Selector
M9	Switch	7263340	Tuner Return
M10	Relay	1220326	
M11	Solenoid & Plunger Assy.	1220685	
A5,A6	Trimmer Cap.	7242454	Dual (Osc. & RF. Trimmer)
A7	Trimmer Cap.	7264097	Ant.
	Knob	7264150	On-off-volume & tuning
	Knob	1341536	Tone
	Knob	1341337	Sensitivity
	Indicator	1220192	Selector Tab (Set of 5)
	Board	7263916	Tab Rail
	Contact	1220193	Push button slide (set of 5)
	Contact	1220191	Selector Tab (set of 5)
	Pushbutton & Slide Assy.	1220282	
	Dial	7264102	Calibrated
	Dial Glass	7263408	
	Pointer Arm Assy.	7263360	

POWER SUPPLY SUB-CHASSIS





IF=260KC

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RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
1	12BA6	4.7Meg	0Ω	TP	0Ω	12.8KΩ	12.8KΩ	180Ω 81.8KΩ		
2	12BE6	22KΩ	2Ω	2Ω	32	11.8KΩ	12.8KΩ	2.5Meg		
3	12BA6	2.2Meg	0Ω	0Ω	TP	11.8KΩ	12.8KΩ	180Ω		
4	12AV6	2.2Meg	220Ω	TP	0Ω	847KΩ	0Ω	232KΩ		
5	12AV6	4.5Meg	3.3KΩ	TP	0Ω	0Ω	2Meg	232KΩ		
6	12V6GT	TP	TP	230Ω	11.8KΩ	328KΩ	TP	0Ω	360Ω	
7	12V6GT	TP	0Ω	230Ω	11.8KΩ	328KΩ	TP	0Ω	360Ω	
8	12AU7	1190KΩ	1.2Meg	460KΩ	TP	0Ω	11.8KΩ	230KΩ	230KΩ	0Ω
9	0Z4	TP	NC	230Ω	NC	230Ω	NC	TP	20KΩ	

1 MEASURED FROM PIN 9 OF V8
2 MEASURED WITH SENSITIVITY SWITCH IN MINIMUM SENSITIVITY POSITION.
ALL MEASUREMENTS WITH SENSITIVITY SWITCH IN MAXIMUM SENSITIVITY POSITION UNLESS OTHERWISE DESIGNATED
TP - TIE POINT
NC - NO CONNECTION

1 DC voltage measurement taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2 Socket connections are shown as bottom views.
3 Measured values are from socket pin to ohassis negative.
4 Resistance values are in ohms, K=1000, Meg=1,000,000.
5 Printed tolerance on components values underwritten a variation of ± 10% in voltage and resistance readings.
6 Volume control at maximum, no signal applied for voltage measurements.

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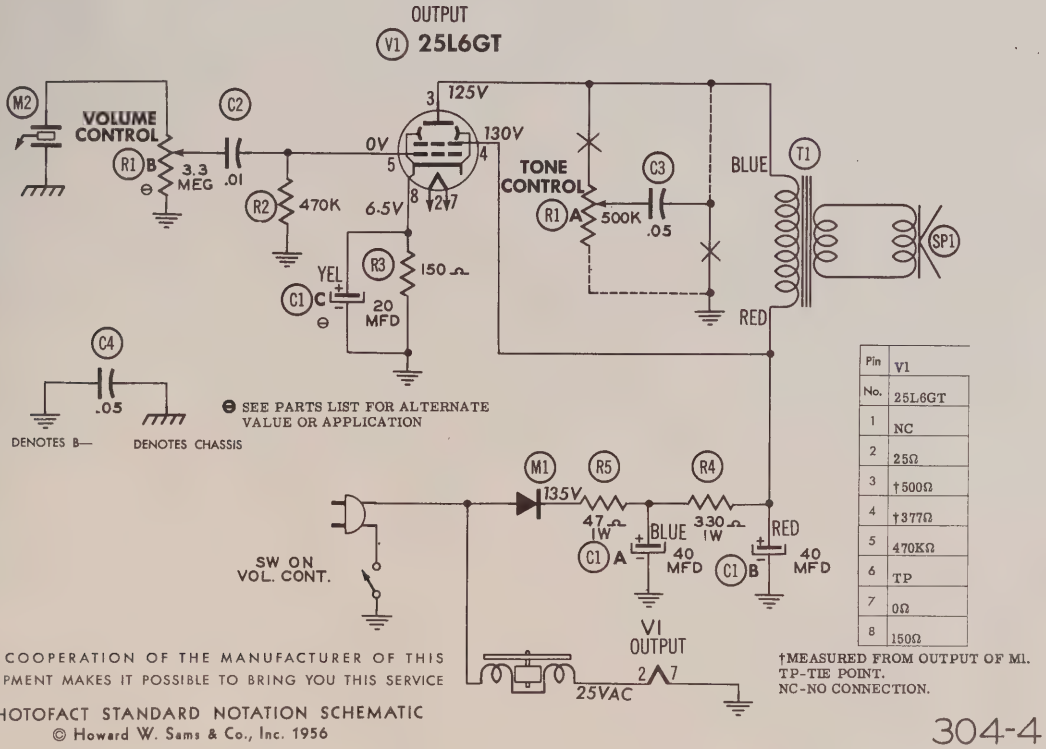
COLUMBIA RECORDS MODELS 410, 413

...TY OF
...F. BLANKENSHIP
3924 MEADE ST.
...NVER, COLORADO

COLUMBIA RECORDS MODELS 410, 413

TRADE NAME	Columbia Records Models 410, 413
MANUFACTURER	Columbia Records, 799 Seventh Ave., New York 19, N. Y.
TYPE SET	AC Operated Phono Amplifier with 3 Speed Manual Record Player
TUBES (One)	Type 25L6GT Audio Output
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .32 Amp. @ 117 Volts AC



THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

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304-4

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		COLUMBIA PART No.	STANDARD REPLACEMENT		
V1	Audio Output	25L6GT	25L6GT	7AC	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	COLUMBIA PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	40	150		TCT3116	TDL-404020-150	FMT-312	Blue
B	40	150					Red
C	20	150					Yel. -Note 1

Note 1. Some versions may use a separate 20MFD-25 Volt unit in this application.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	COLUMBIA PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	
C2	.01	200		D6-103	GP3-333-103	PT411	
C3	.05	200		DF-503		PT415	
C4	.05	400		DF-503		PT415	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	COLUMBIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	1/2		F1-40		QJ-864R♦	UF55L	Tone (Panel)
B	3.3Meg	1/2		R2-79			UR36A	Volume (Rear) See Note 1
C	Switch			KB-1			US-26	Attach to R1B.

Note 1. Model 413 uses 1Meg volume control section.
♦CONCENTRIKIT EQUIVALENT; K-5 KIT, BASE ELEMENTS AND SHAFTS; B11-133, P1-020 (Panel)
B13-140, R2-028 (Rear)
76-1 (Switch)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	COLUMBIA PART No.	IRC PART No.	
R2	470K	1/2		BTS-470K	
R3	150Ω	1/2		BTS-150	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	COLUMBIA PART No.	IRC PART No.	
R4	330Ω	1		BTA-330	
R5	47Ω	1		BTA-47	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	COLUMBIA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.2KΩ	3.3Ω	TR-122	Z1101	A-3025	A-3332	26S58 ①	S-12X	① Drill one new mounting hole.

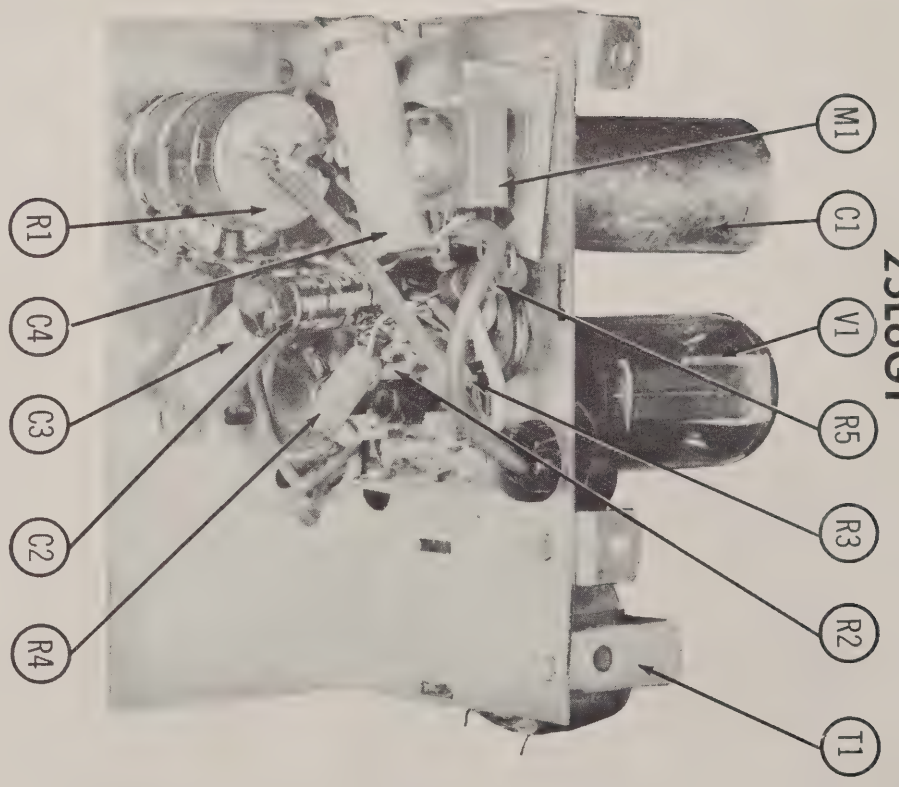
SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	COLUMBIA PART No.	QUAM PART No.	
SP1	4"	PM	3.3Ω	SP-102	4A07	① Used in Model 413.
	4"x 6"	PM	3.3Ω	SP-48 ①	46A1	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	COLUMBIA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.050A		1263A	RS050	6S65	8J1	65	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	COLUMBIA PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M3		†CR-55 or ♦CR-55D and †CR-55LP or ♦CR-55LPD	†C-449 or ♦C-449D and †A-448 or ♦A-448D	†W-64S and †W-64MGS	† Jewel ♦ Diamond

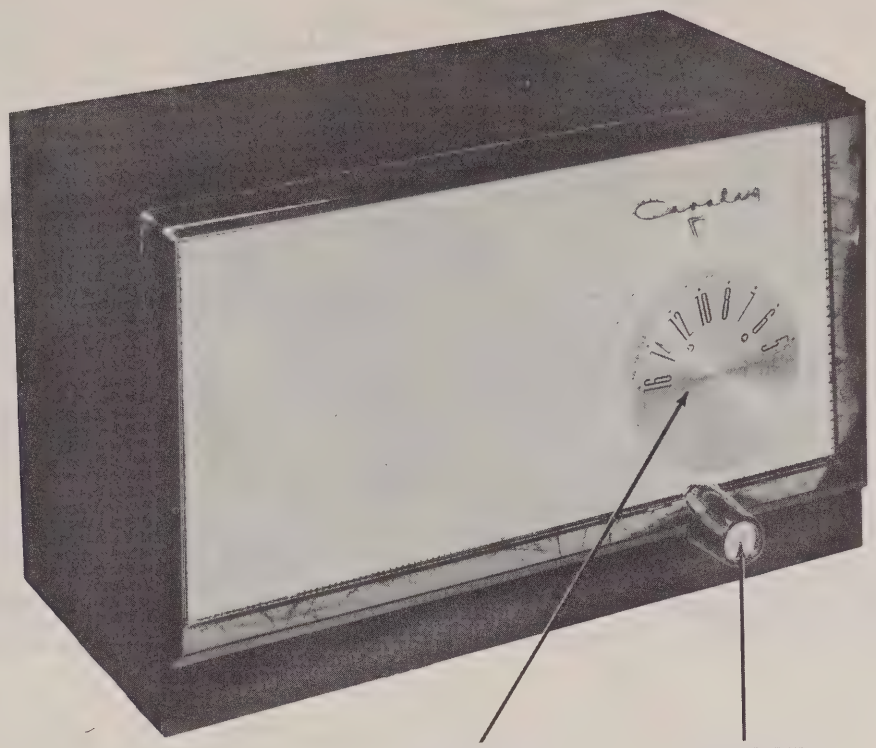
PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA						REMARKS
	COLUMBIA PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.			
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE		
M2		112-TS	A-1 and A-3	46-T	0-1 or S-1 and 0-3		
		*P-55-T		♦2447			

* Complete Astatic arm & cartridge assembly, should be mounted to make certain lid can be closed when the arm is in rest position.
♦ Complete Electro-Voice arm & cartridge assembly.
ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

CROSLEY MODELS JT3BK, GN, IY, RD (Ch. R100), JT4BK, GN, IY, RD (Ch. R101)

PROPERTY OF
L. F. HAWKINSHIP
[illegible]



CROSLEY MODELS JT3BK, GN, IY, RD (Ch. R100), JT4BK, GN, IY, RD (Ch. R101)

TRADE NAME	Crosley Models JT3BK, GN, IY, RD (Ch. R100), JT4BK, GN, IY, RD (Ch. R101)
MANUFACTURER	Crosley Corp., 1329 Arlington St., Cincinnati, Ohio
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types: 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC
RATING	.25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC-1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~ Mod.)	Tuning Gang fully open.	Across Voice Coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop (Radiated)	1650KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune 1400KC signal.	"	A6	"

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PARTS LIST AND DESCRIPTIONS

CROSLEY
Model JT3BK

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		CROSLEY PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	Det. -AVC-AF Amp.	12AT6	12AT6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rect.	35W4	35W4	5BQ	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	CROSLEY PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	40	150		TCD48	TDL-D40-150	MTD-1540	Blue - Note 1
B	40	150					Red

Note 1. Some versions may use a 50-30MFD at 150V unit (Part No. 155006) in this application.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	CROSLEY PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	
C2	.047	400	3947-45	DF-503		PT4147	
C3A	125		♦170022-9				
B	5000						
C	5000						
D	100						
E							
F							
C4	.022	400	39478-43	DF-203	817-02	PT4122	
C5	.047	400	39478-45	DF-503		PT4147	
C6	.047	400	39478-45	DF-503		PT4147	

♦ Items C7A, C7B, C7C, C7D, C7E, C7F, R5A, R5B, and R5C are combined in one unit. When replacing items separately, items C3D, C3E, and C7F should total 100MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CROSLEY PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500KΩ	½	39378-11	AB-60	A47-500K-Z	Q13-133	U-48	Volume
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A.
C	Switch		Not Req.	KB-1	SWE-12	76-1	US-26	Attach to R1A.

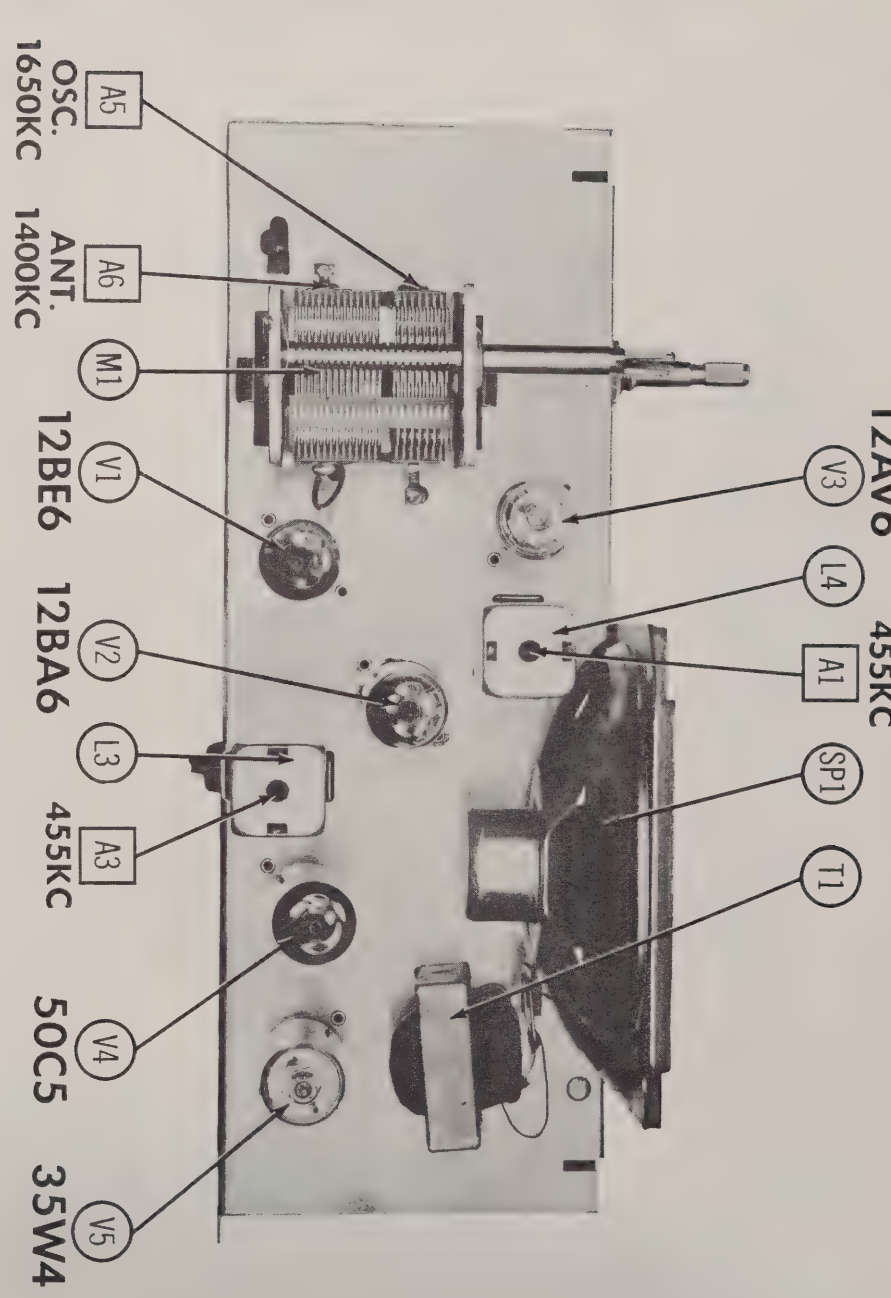
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CROSLEY PART No.	IRC PART No.	
R2	22KΩ	½	39374-41	BTS-22K	
R3	2.2Meg	½	39374-69	BTS-2.2Meg	
R4	220Ω	½	39374-17	BTS-220	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CROSLEY PART No.	IRC PART No.	
R5A	10Meg		♦170022-9	BTS-10Meg	
B	470KΩ			BTS-470K	
C	470KΩ			BTS-470K	
R6	1200Ω	1	39374-114	BTA-1200	
R7	150Ω	½	39374-15	BTS-150	

♦ Items R5A, R5B, R5C, C7A, C7B, C7C, C7D, C7E, C7F are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	CROSLEY PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.4KΩ	3.4Ω	155015	Z-1101	A-3025	A-3332	26S58 ①	S-12X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	CROSLEY PART No.	QUAM PART No.	
SP1	4"	PM	3.4Ω	159880-1	4A07	

COILS (RF-IF)

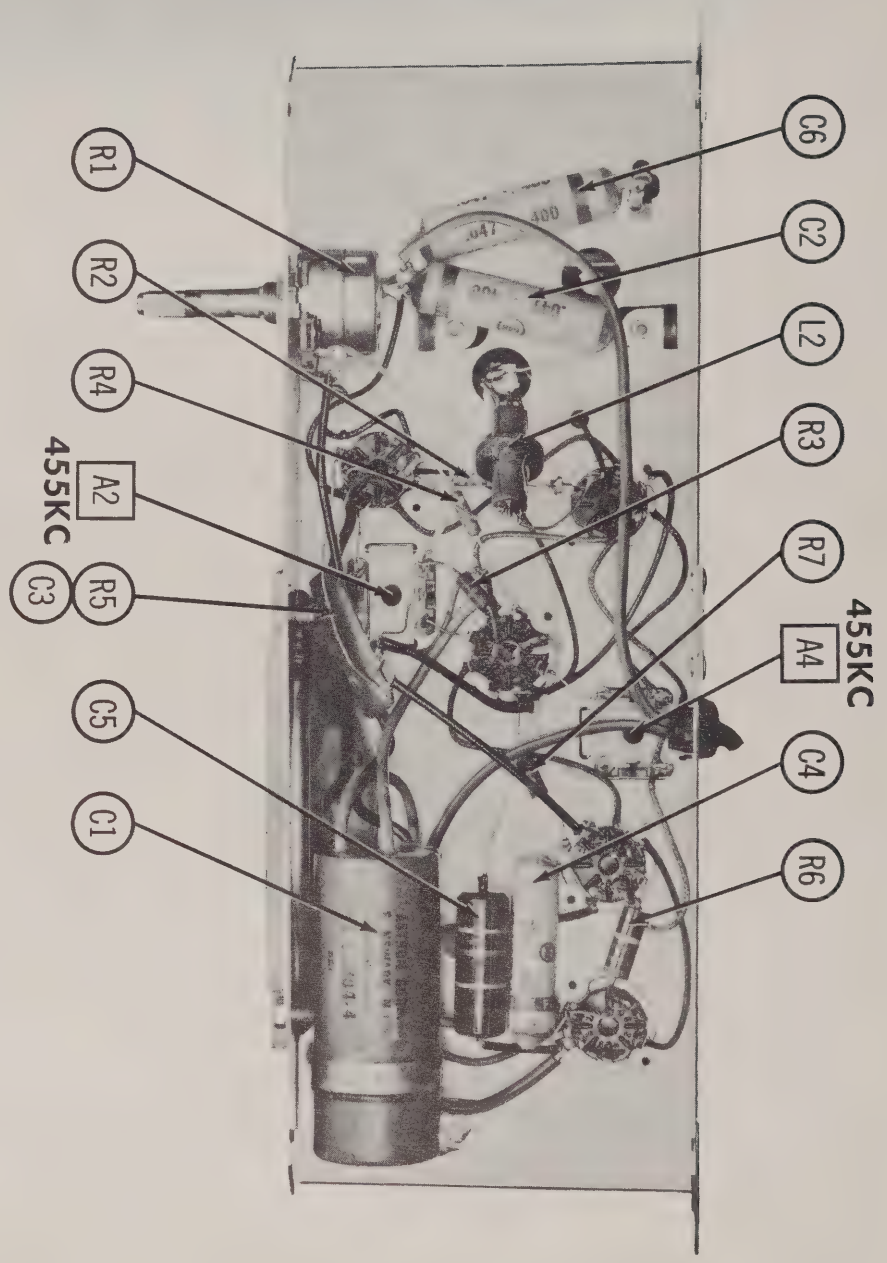
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	CROSLEY PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3.1Ω		170022-8				Includes cabinet back - Note 1
L2	Osc. Coil	1.9Ω	8.3Ω	170022-5	14-1073		69-Osc.*	
L3	Input IF	15Ω	15Ω	139919-3	16-6758	BC-352	12-C1	
L4	Output IF	15Ω	15Ω	139919-3	16-6758	BC-353	12-C2	

Note 1. Part No. 170022-7 used on Model JT3
* Drill mounting hole.

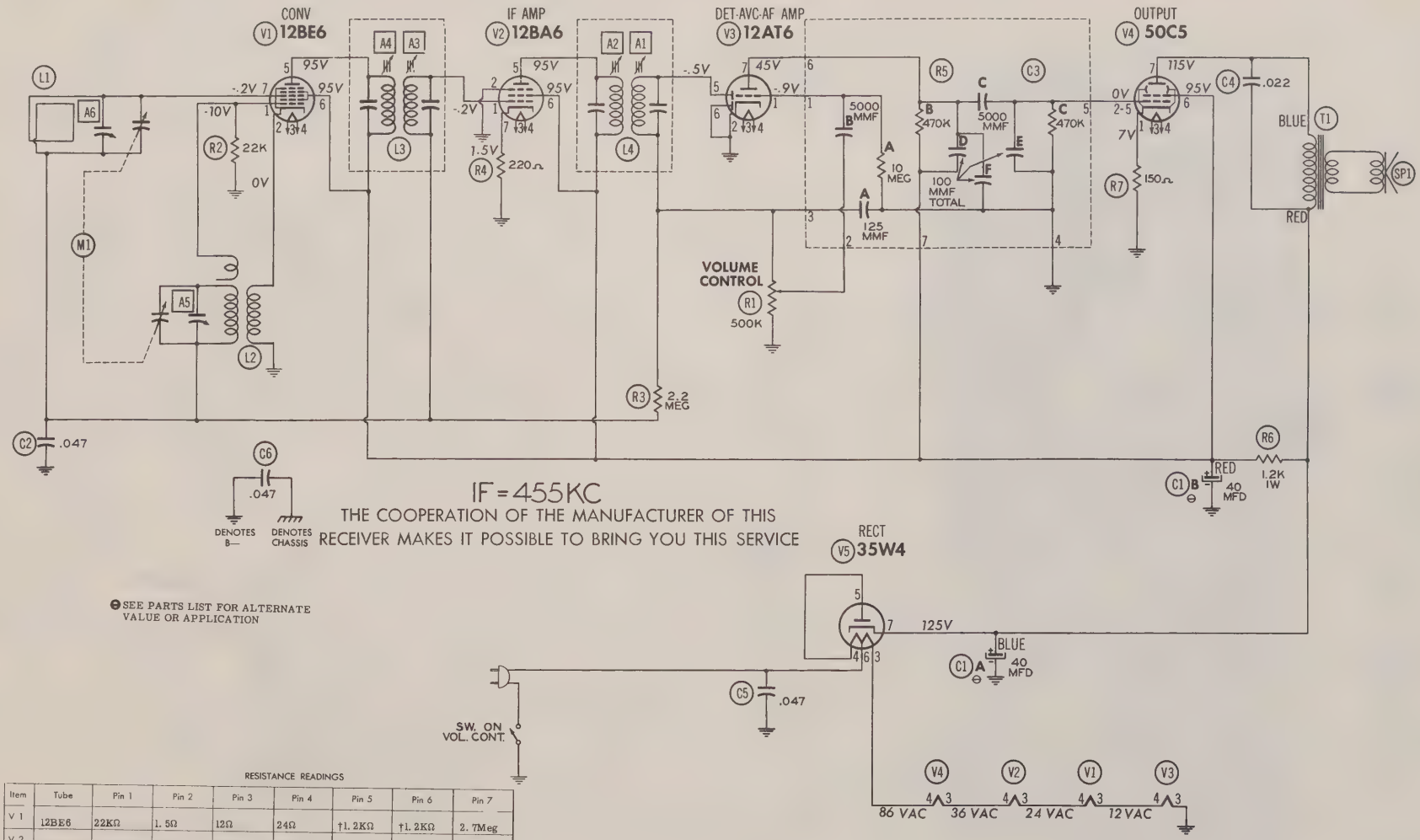
MISCELLANEOUS

ITEM No.	PART NAME	CROSLEY PART No.	NOTES
M1	Tuning Cap.	170022-3	2 Gang (23-390MMF, 16-105MMF)
	Cabinet	170023-1	Model JT3BK
	Cabinet	170023-2	Model JT3RD
	Cabinet	170023-3	Model JT3IY
	Cabinet	170023-4	Model JT3GN
	Cabinet, Grille, & Name Plate Assy.	170023-28	Model JT4BK
	Cabinet, Grille & Name Plate Assy.	170023-29	Model JT4RD
	Cabinet, Grille, & Name Plate Assy.	170023-30	Model JT4IY
	Cabinet, Grille, & Name Plate Assy.	170023-31	Model JT4GN
	Knob	170023-17	On-Off-Volume-Models JT3BK, JT4BK
	Knob	170023-18	On-Off-Volume-Models JT3RD, JT4RD
	Knob	170023-19	On-Off-Volume-Models JT3IY, JT4IY
	Knob	170023-20	On-Off-Volume-Models JT3GN, JT4GN
	Knob	170023-21	Tuning-Model JT3BK
	Knob	170023-22	Tuning-Model JT3RD
	Knob	170023-23	Tuning-Model JT3IY
	Knob	170023-24	Tuning-Model JT3GN
	Knob	170023-25	Tuning-Models JT4BK, JT4IY, JT4RD, JT4GN

CHASSIS—BOTTOM VIEW



CROSLEY
Model JT3BK



IF = 455KC

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⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	1. 5Ω	12Ω	24Ω	†1. 2KΩ	†1. 2KΩ	2. 7Meg
V 2	12BA6	2. 7Meg	0Ω	24Ω	36Ω	†1. 2KΩ	†1. 2KΩ	220Ω
V 3	12AT6	10Meg	0Ω	0Ω	12Ω	500KΩ	0Ω	†471KΩ
V 4	50C5	150Ω	470KΩ	36Ω	86Ω	470KΩ	†1. 2KΩ	†200Ω
V 5	35W4	TP	NC	86Ω	121Ω	121Ω	116Ω	50KΩ

†MEASURED FROM PIN 7 OF V5.
TP-TIE POINT.
NC-NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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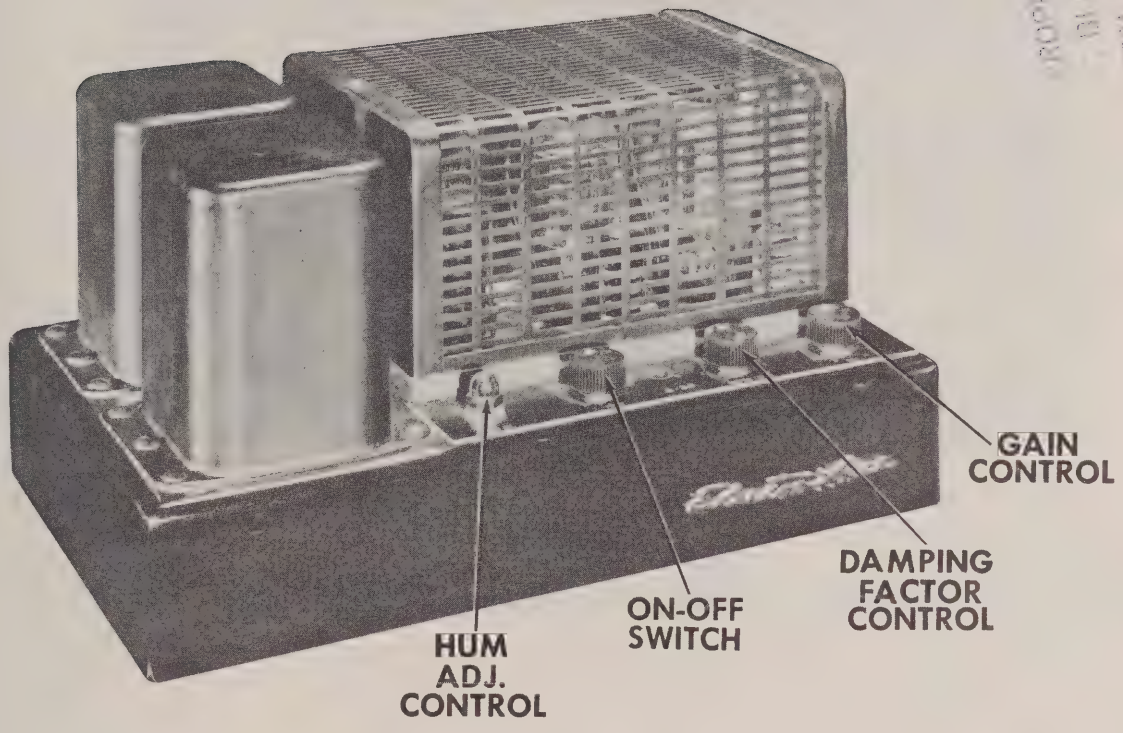
ELECTRO-VOICE
MODEL A30



ELECTRO-VOICE
MODEL A30

TRADE NAME	Electro-Voice Model A30
MANUFACTURER	Electro-Voice, Inc., Buchanan, Michigan
TYPE SET	AC Operated 30 Watt Audio Amplifier
TUBES (Six)	Types 12AX7 AF Amp.-Phase Inv., 12BH7 Driver, (2) 6BG6G Output, (2) 5Y3GT Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycles
RATING	.83 Amp. @ 117 Volts AC

THIS FOLDER REPLACES FOLDER 4-SET 293

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PARTS LIST AND DESCRIPTIONS

ELECTRO-VOICE
Model A30

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		Electro-Voice PART No.	STANDARD REPLACEMENT		
V1	AF Amp. - Phase Inv.	12AX7	12AX7	9A	
V2	Driver	12BH7A	12BH7A	9A	
V3	Audio Output	6BG6G	6BG6G	5BT	
V4	Audio Output	6BG6G	6BG6G	5BT	
V5	Rectifier	5Y3GT	5Y3GT	5T	
V6	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT	Electro-Voice PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	▰40	500	4247			FP288	TM-D40-500	D-275	
B	▲40	500							
C2A	▲40	500	4247			FP288	TM-D40-500	D-275	
B	▰40	500							
C3	20	450	4246			FP144	TM-20-450	S-260	
C4	50	100	4242			TC49	TD-50-150	FM-1550	
C5A	▰500	25	4249			TC2505	TD-500-25	MTH-2550	
B	▲500	25				TC2505	TD-500-25	MTH-2550	
C6	.1	200	4265	DF-104		PT401	IMP4-P1	330201	
C7	50		4264	DD-500	GP1K-500	UC-545		K-1450	
C8	.022	400	4260	DF-203		PT4122	IMP4-S22	3304122	
C9	.047	400	4243	DF-503		PT4147	IMP4-S47	3304147	
C10	.047	400	4243	DF-503		PT4147	IMP4-S47	3304147	
C11	.1	600	4241	DF-104		PT601	IMP6-P1	330601	
C12	.1	600	4241	DF-104		PT601	IMP6-P1	330601	
C13	10000		4252	DD-103	811-01	DC511	IMP4-S1	330411	
C14	10000		4252	DD-103	811-01	DC511	IMP4-S1	330411	
C15	.047	400	4243	DF-503		PT4147	IMP4-S47	3304147	
C16	.047	400	4243	DF-503		PT4147	IMP4-S47	3304147	

CONTROLS

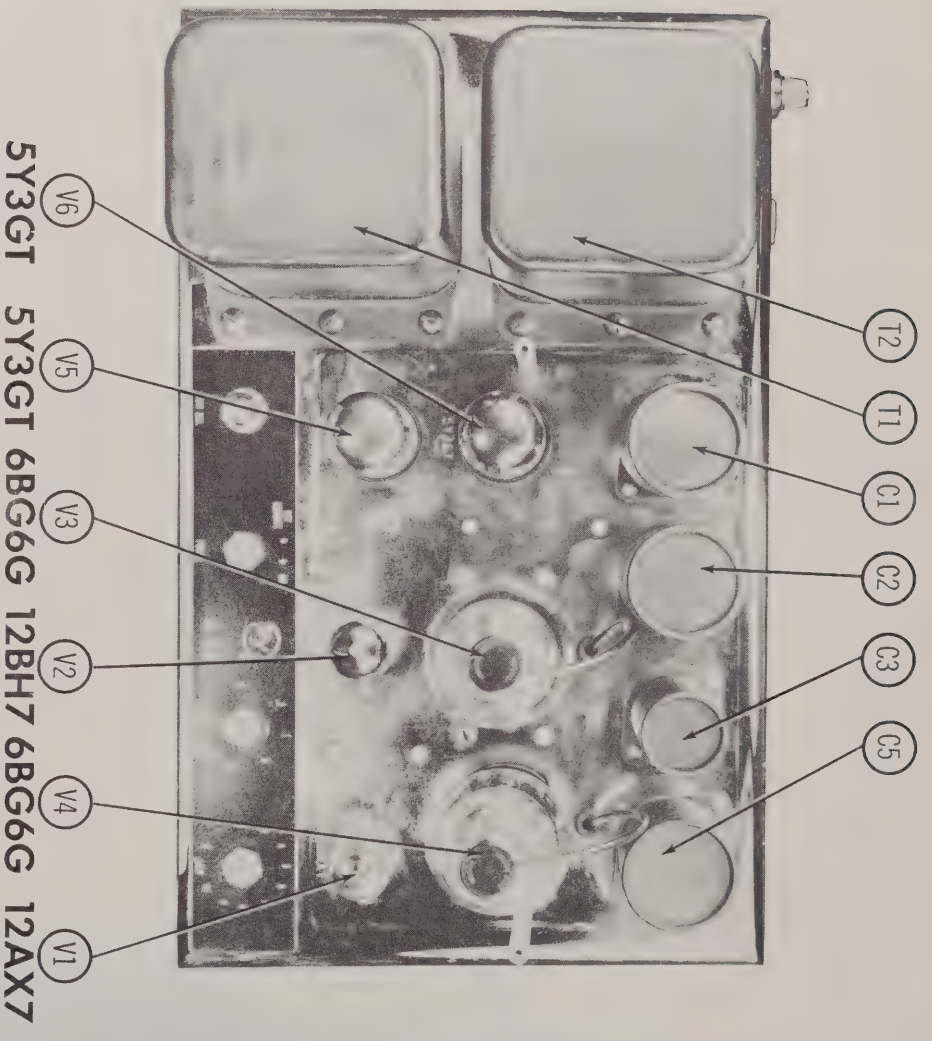
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Electro-Voice PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1	200Ω	2	D-4686	W-200	A43-200	VK-123	R250L	Hum - Wire wound
R2A	1Ω	2	A-4686					Damping Factor (Wire Wound)
B	1800Ω	2						Wire Wound
R3A	250KΩ	½	C-4686	Q13-130	A47-250K-Z	B-51	U-44	Gain
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Electro-Voice PART No.	IRC PART No.	
R4	2.7Ω 5%	1	4680		
R5	270KΩ	½	4669	BTS-270K	
R6	1.2Meg	½	4656	BTS-1.2Meg	
R7	470Ω	½	4654	BTS-470	
R8	27KΩ	½	4651	BTS-27K	
R9	27KΩ	½	4651	BTS-27K	
R10	56KΩ	½	4652	BTS-56K	
R11	56KΩ	½	4652	BTS-56K	
R12	470KΩ	½	4650	BTS-470K	
R13	1200Ω	½	4658	BTS-1200	
R14	12KΩ	2	4679	BTB-12K	
R15	470K	½	4650	BTS-470K	
R16	12KΩ	2	4679	BTB-12K	
R17	470KΩ	½	4650	BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Electro-Voice PART No.	IRC PART No.	
R18	120Ω	½	4607	BTS-120	
R19	33Ω	½	4681	BTS-33	
R20	470KΩ	½	4650	BTS-470K	
R21	120Ω	½	4607	BTS-120Ω	
R22	33Ω	½	4681	BTS-33	
R23	220Ω	½	4664	BTS-220	
R24	47KΩ	½	4668	BTS-47K	
R25	33KΩ	½	4665	BTS-33K	
R26	39KΩ	2	4682	BTB-39K	
R27	39KΩ	2	4682	BTB-39K	
R28	47Ω	2	4683		
R29	100Ω	4	4684	PW4-100	
R30	100Ω	4	4684	PW4-100	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	Electro-Voice PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .83A	730VCT .040ADC	724VCT .037ADC	40VAC .0015ADC	1566					
	SEC 4	SEC 5	SEC 6	SEC 7						
	22VAC	5VAC @ 2A	5VAC @ 2A	6.3VAC @ 2.7A						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Electro-Voice PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	1030Ω CT Tap @ 600Ω CT	16Ω Tap @ 8Ω, 4Ω	1565						

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	Electro-Voice PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	150MA Bridge	5915	1016	B1B			154B	① Fabricate mounting.
M2	.0015	5914	1159	CR-10	8S20①		10	

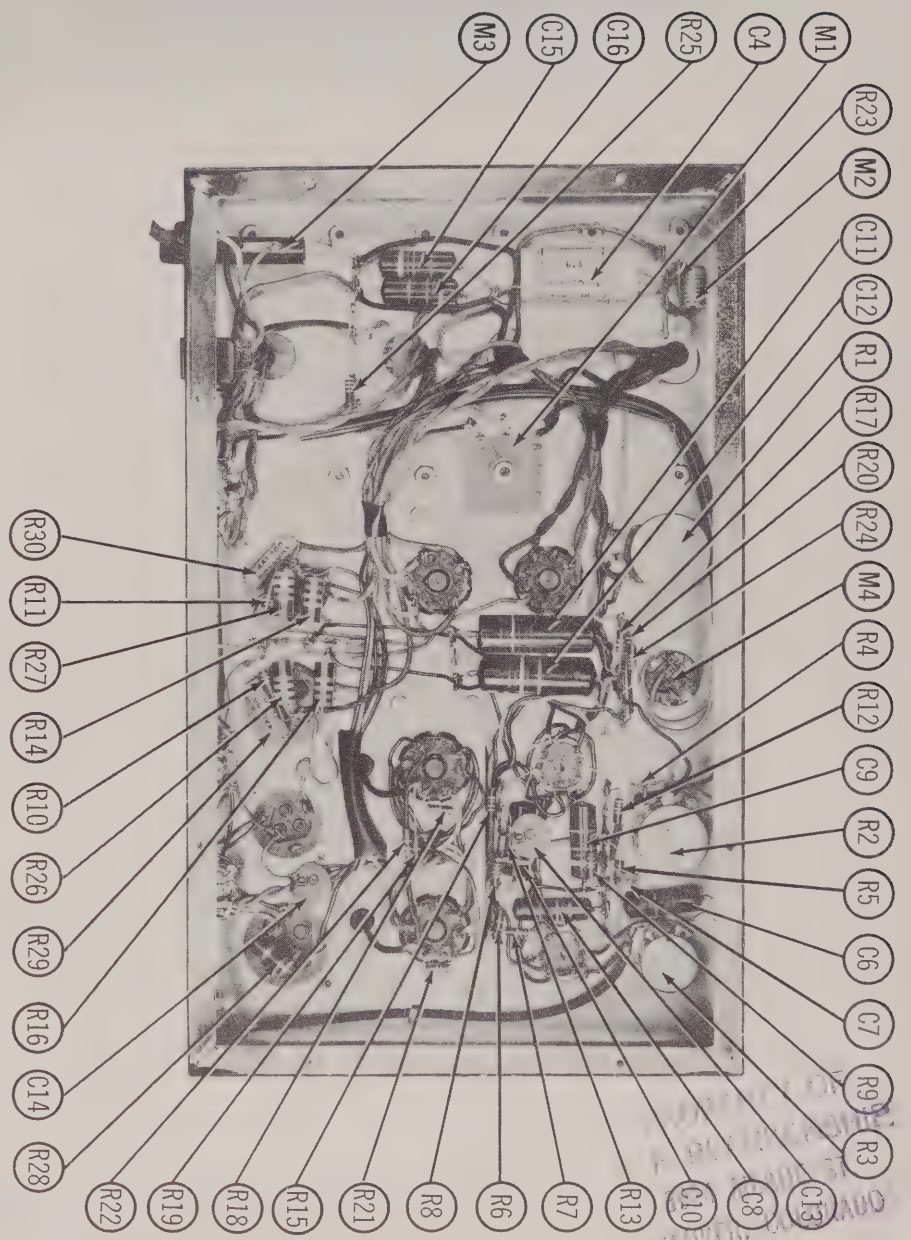
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Electro-Voice PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	3AG S/B	2A 125V	313002		313002, (3AG-S/B-2A)	342001	MDL2	HKP

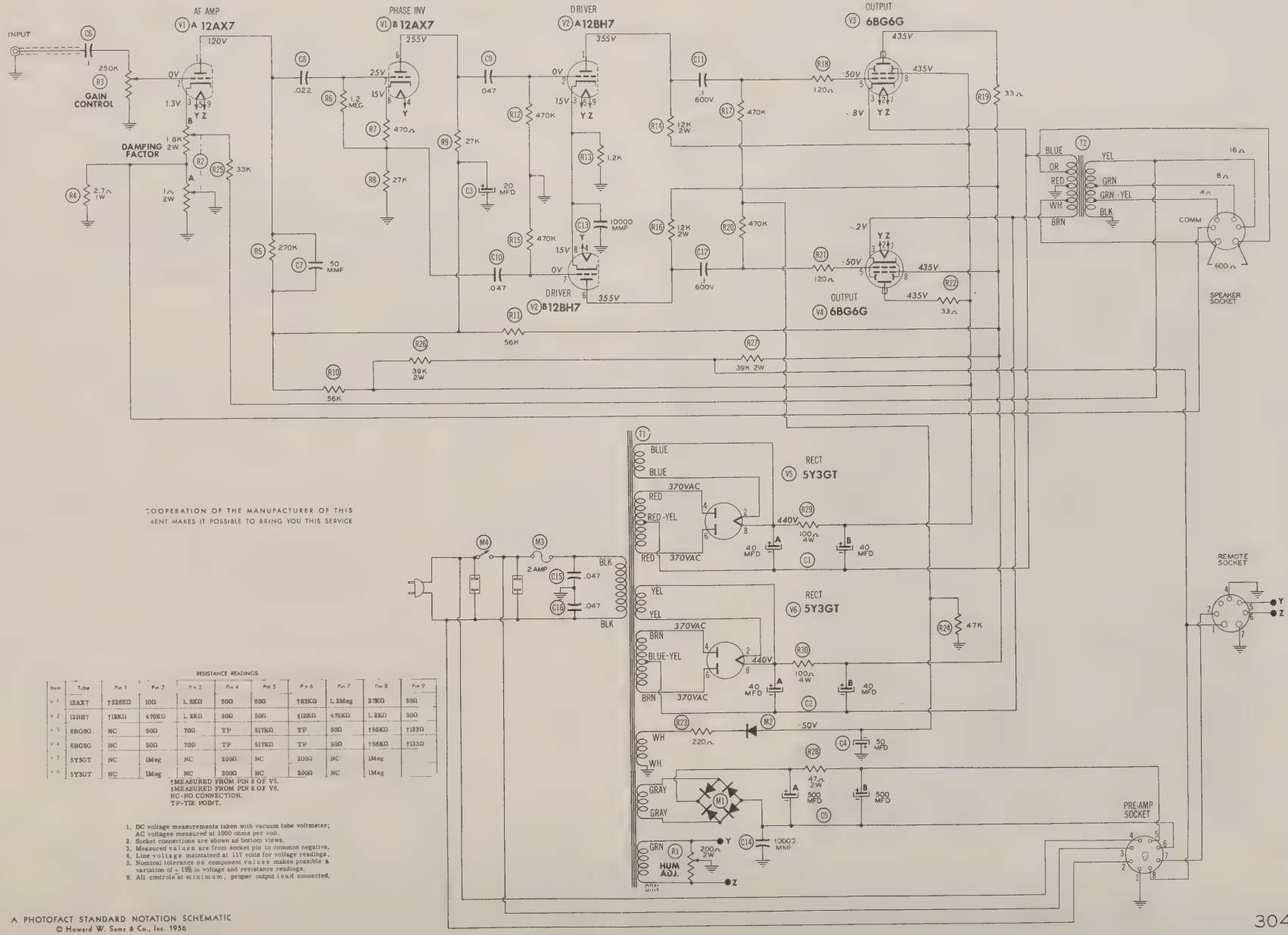
MISCELLANEOUS

ITEM No.	PART NAME	Electro-Voice PART No.	NOTES
M4	Switch	5641	On-Off (Power)

CHASSIS—BOTTOM VIEW



ELECTRO-VOICE Model A30



COOPERATION OF THE MANUFACTURER OF THIS
AENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	†328KΩ	10Ω	1.8KΩ	50Ω	50Ω	†83KΩ	1.2MEg	27KΩ	50Ω
V 2	12BH7	†12KΩ	470KΩ	1.2KΩ	50Ω	50Ω	†12KΩ	470KΩ	1.2KΩ	50Ω
V 3	6BG6G	NC	50Ω	70Ω	TP	517KΩ	TP	50Ω	†56KΩ	†133Ω
V 4	6BG6G	NC	50Ω	70Ω	TP	517KΩ	TP	50Ω	†56KΩ	†133Ω
V 5	5Y3GT	NC	1Meg	NC	200Ω	NC	200Ω	NC	1Meg	
V 6	5Y3GT	NC	1Meg	NC	200Ω	NC	200Ω	NC	1Meg	

†MEASURED FROM PIN 8 OF V5.
†MEASURED FROM PIN 8 OF V6.
NC-NO CONNECTION.
TP-TIE POINT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

EMERSON Ch. 120233-D, -F, 120234-D, 120235-D, 120236-D, 120237-D, 120238-D, -F, -H, 120241-D, -F, 120249-D, -F)

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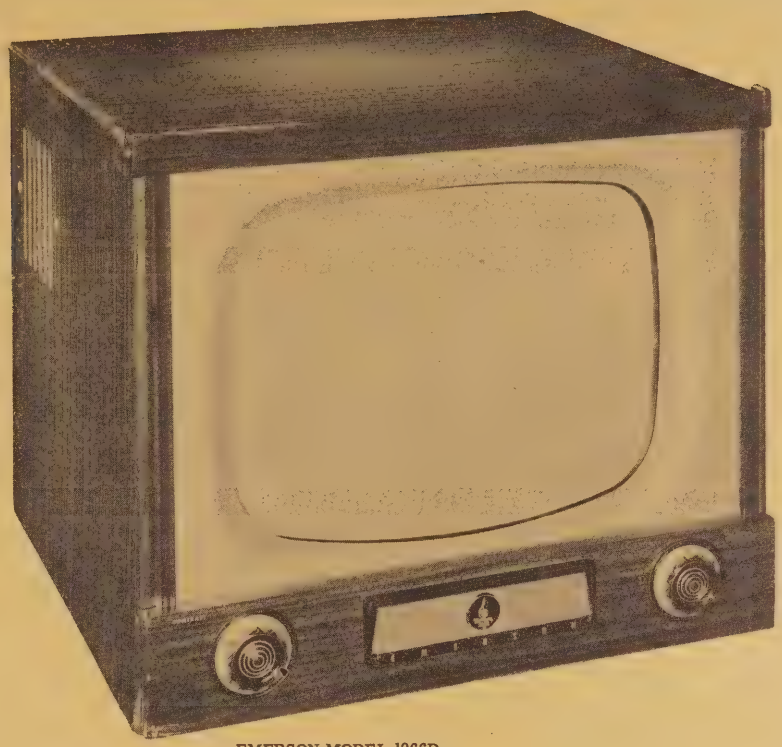

EMERSON MODEL 1066D

TRADE NAME	Emerson	MODELS	CHASSIS
		1066D, 1068D, 1070D, 1072D, 1012H	120233-D
		1012J, 1014J	120233-F
		1067D, 1069D, 1071D, 1073D	120234-D
		1044D, 1046D, 1048D, 1054D, 1056D, 1074D, 1084D, 1086D, 1088D, 1090D, 1092D, 1100D, 1002H, 1004H, 1006H, 1008H, 1018H, 1020H, 1036H, 1040H, 1042H	120235-D
		1045D, 1047D, 1049D, 1055D, 1057D, 1075D, 1085D, 1087D, 1089D, 1091D, 1093D, 1009J, 1011J	120236-D
		1067F, 1071F	120237-D
		1101D, 1043F, 1049F, 1087F, 1089F, 1091F, 1093F, 1041H, 1045H, 1055H, 1085H	120238-D
		1041F, 1045F, 1047F, 1055F, 1075H	120238-F
		1075F, 1085F	120238-H
		1050D	120241-D
		1098D	120241-F
		1051D	120249-D
		1099D	120249-F

MANUFACTURER	Emerson Radio & Phono Corp., 14th & Coles Sts., Jersey City 2, N.J.
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 1.56 Amp. @ 117 Volts AC
TUNING RANGE	Channel 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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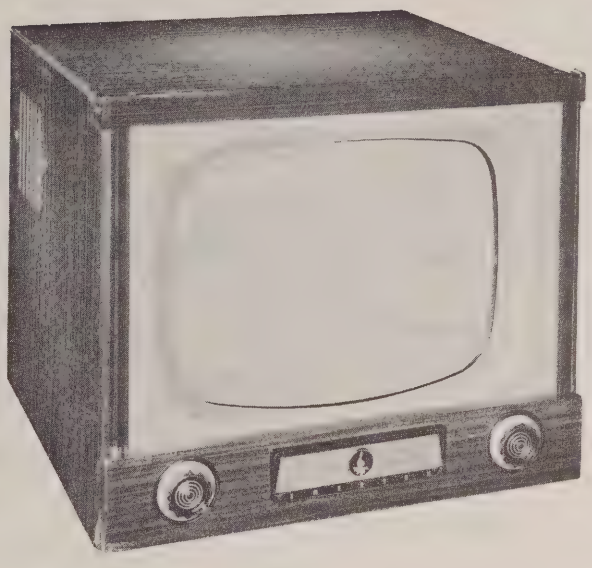
DATE 1-56 SET 304 FOLDER 7

EMERSON Ch. 120233-D, -F, 120234-D, 120235-D, 120236-D, 120237-D, 120238-D, -F, -H, 120241-D, -F, 120249-D, -F)

EMERSON Ch. 120233-D, -F, 120234-D, 120235-D, 120236-D, 120237-D, 120238-D, -F, -H, 120241-D, -F, 120249-D, -F)



CHASSIS

120233-D, 120233-F, 120234-D, 120235-D, 120236-D, 120237-D, 120238-D, 120238-F, 120238-H, 120241-D, 120241-F, 120249-D, 120249-F

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type control knobs from front panel of cabinet.
2. Remove 7 wood screws. Remove rear cover.
3. Loosen 2 wood screws. Remove antenna bracket.
4. Disconnect speaker leads.
5. Remove 4 chassis bolts. Remove chassis.
6. Remove 2 speaker nuts. Remove speaker.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet above and slightly to the left of the channel selector shaft.

PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove 6 wood screws holding plastic strip at the top edge of safety glass. Remove plastic strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

SPECIAL ADJUSTMENTS

A. Picture stabilizer Control Adjustment

In normal signal areas the picture stabilizer control (R7) should be set at its maximum clockwise position. In noisy fringe areas rotate R7 counter clockwise for best sync stability.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator can be made from the rear panel of the set. Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (B1) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the sound discriminator secondary (L18) located on top of chassis.

FUSES

One fuse is used for LV power supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting a magnetic ring around the neck of the picture tube located flush against the yoke. Loosen the thumb screw and rotate the ring around the tube until the picture is properly centered.

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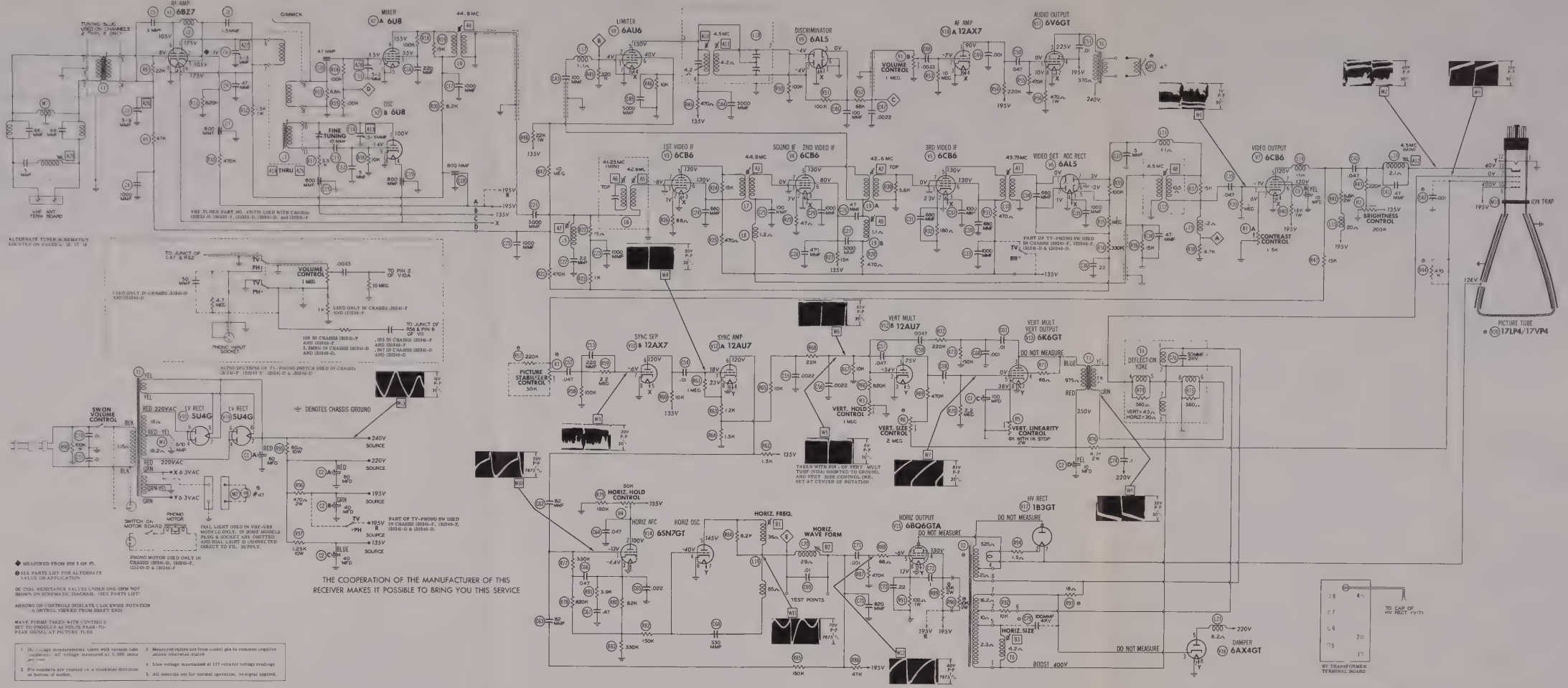

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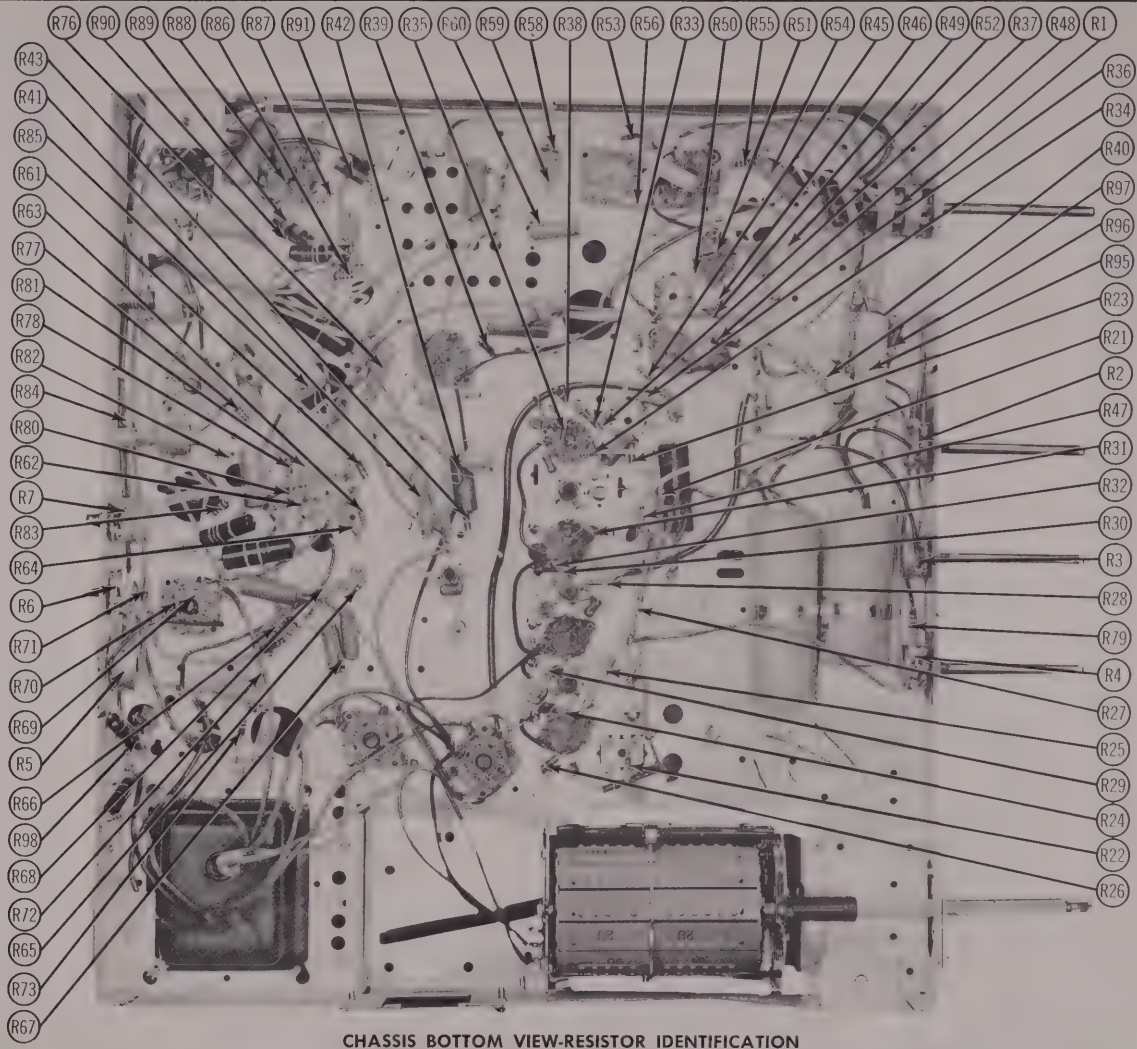
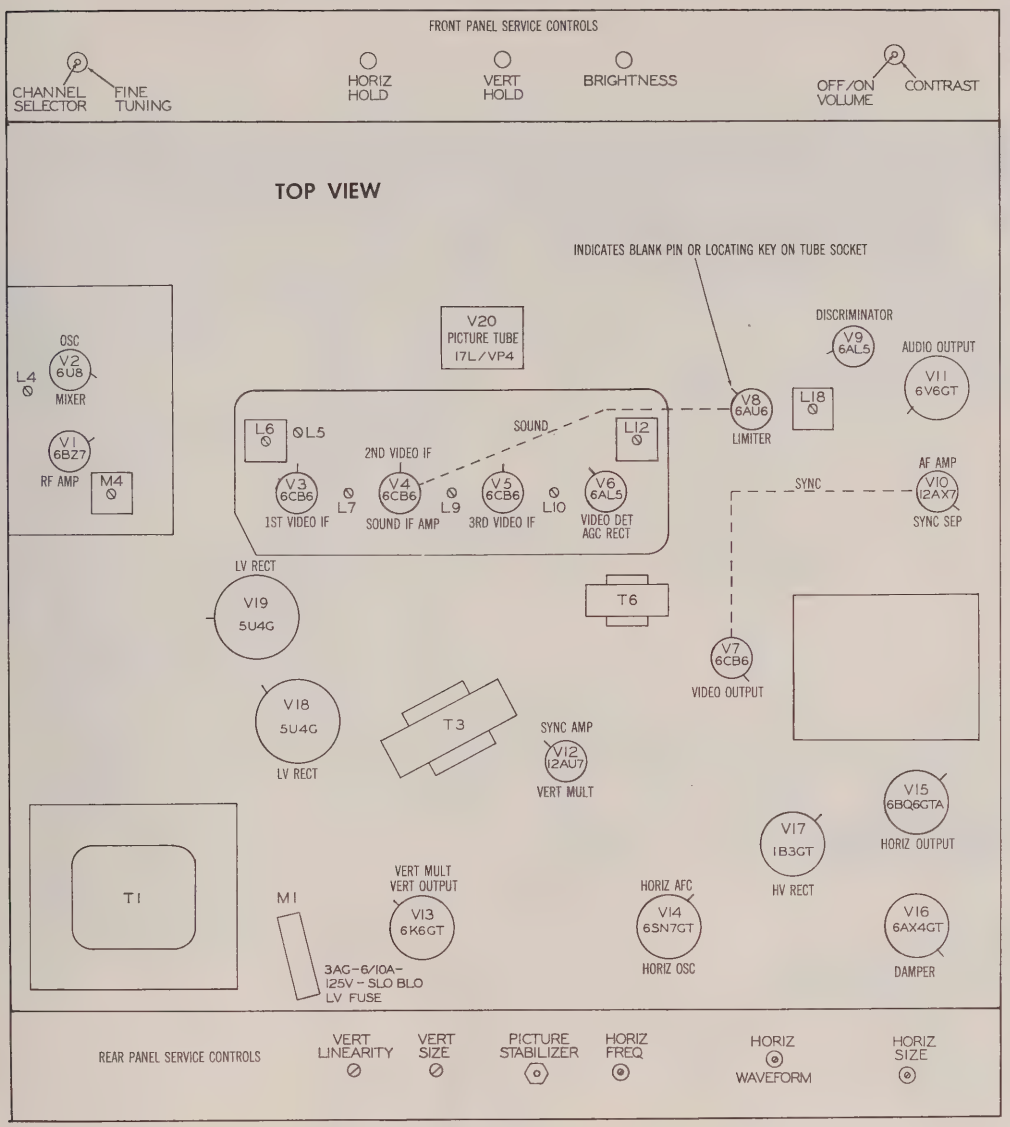
EMERSON (Ch. 120233-D, -F, 120234-D, 120235-D, 120236-D, 120237-D, 120238-D, -F, -H, 120241-D, -F, 120249-D, -F)



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V18, V19, Fuse (M1)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V5, V6, V7, V20**
Has pic, no sound - **V4, V8, V9, V10, V11**

SYNC FAILURE
No vert. sync - **V12, V13**
No horiz. sync - **V12, V14**
No vert. or horiz. sync - **V10, V12**

SWEEP FAILURE
No raster, has sound - **V14, V15, V16, V17, V20**
No vertical deflection - **V12, V13**
Poor vert. linearity or foldover - **V12, V13**
Poor horiz. linearity or foldover - **V14, V15, V16**
Narrow picture - **V14, V15, V16, V17, V18, V19**
Vert. off freq. - **V12, V13**
Horiz. off freq. - **V12, V14**

PROPERTY OF
L. F. BLANKENSHIP
3026 MEADE ST.
DENVER, COLORADO

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS -READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Picture tube may be removed from chassis for easier slug adjustments. The high voltage lead should be securely taped and kept away from chassis.

VIDEO IF ALIGNMENT

Remove V1 from its socket to avoid the possibility of undesirable beat response during alignment. Rotate channel selector to channel 13.
Connect the negative lead of a 3 volt battery to the ungrounded side of C38. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube. Low side to chassis.	Not used	45.75MC (Unmod)	10 or 13	Use VTVM. DC probe to point (A). Common to chassis.	A1	Attenuate generator output for not more than -2 volts at VTVM. Adjust for maximum deflection.
2.	"	"	"	42.9MC	"	"	A2, A5	"
3.	"	"	"	44.9MC	"	"	A3, A4	"
4.	"	"	"	41.25MC	"	"	A6	Increase generator output for desirable reading and adjust A6 for MINIMUM deflection.
5.	"	"	"	47.25MC (400 \Mod)	"	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A7	Adjust for MINIMUM 400% indication on scope. Use high scope gain and increase generator output.
6.	"	"	44MC (30MC Swp)	41.25MC 45.75MC 47.25MC	"	"		Use only enough sweep generator output to produce usable pattern on scope. Check for response curve similar to Fig. 1. If necessary slightly retouch A1 thru A5 to obtain desired response. If video marker (45.75MC) is too high readjust A1. If too low, readjust A2. Increase sweep generator and scope output to observe 41.25MC and 45.75MC trap markers. If necessary, retouch A6 for 41.25MC and A7 for 47.25MC trap markers.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Short pin 1 (grid) of 6CB6 (V3) to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to pin 7 (plate) of 6AL5 (V6). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (B) thru 10KΩ. Common to chassis.	A8, A9	Adjust for maximum deflection.
8.	"	"	"	"	DC probe to point (C). thru 10KΩ. Common to chassis.	A10, A11	Detune A11 for maximum negative deflection. Adjust A10 for maximum deflection. Readjust A11 for zero reading on VTVM. A positive and negative reading will be obtained on either side of the correct setting. Remove short from pin 1 of V3.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Short pin 1 (grid) of 6CB6 (V3) to chassis.
Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to pin 7 (plate) of 6AL5 (V6). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. thru 10KΩ to point (B). Low side to chassis.	A8, A9	Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
8.	"	"	"	"	"	Vert. Amp. thru 10KΩ to point (C). Low side to chassis.	A10, A11	Adjust A10 for maximum amplitude and straightness of crossover lines as in Fig. 3. Adjust A11 so that 4.5MC occurs at center of crossover lines. SLIGHTLY retouch A10 for maximum amplitude and straightness of crossover lines. Remove short from pin 1 of V3.

4.5MC TRAP ALIGNMENT

Set contrast control fully clockwise. Short pin 1 (grid) of 6CB6 (V3) to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.01MFD	High side to pin 1 (grid) of 6CB6 (V7). Low side to chassis.	4.5MC (Unmod)	Any	DC probe thru detector (Fig.4) to pin 11 of picture tube. Common to chassis.	A12	Adjust for MINIMUM deflection. Remove short from pin 1 of V3.

ALTERNATE 4.5MC TRAP ALIGNMENT

Replace V1 in its socket. Tune to a TV station and adjust the fine tuning control for maximum 4.5MC beat interference in the picture. Then adjust A12 for MINIMUM 4.5MC beat interference in the picture.

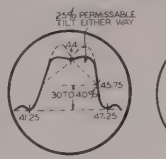


FIG.1

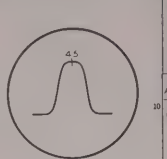


FIG.2

FIG.3

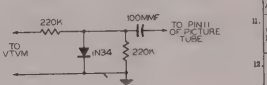


FIG.4

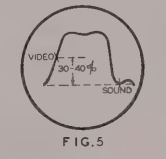


FIG.5

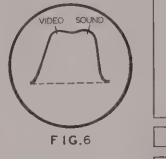


FIG.6

VHF OSCILLATOR ALIGNMENT

Complete Oscillator Alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels, it may be necessary to correct them in one step using A13 Note. A13 adjustment not in tuner Part No. 470696. It should be noted that A13 is an all channel adjustment for the oscillator section and should not be used to correct any one channel If A13 will not bring in all channels well within the range of the fine tuning control, it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel oscillator adjustment screws are reached through a hole just above and slightly to the left of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each VHF channel. Replace shield over converter tube. Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (30MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A14	Advance gain so that the sound notch is visible on response curve. Adjust to place sound marker in trap notch. Video marker should fall at 30 to 40% of maximum on opposite slope of response curve as in Fig. 5.
			213MC (30MC Swp)	211.25MC 215.75MC	13		A15	
			201MC (30MC Swp)	199.25MC 203.75MC	11		A16	
			195MC (30MC Swp)	193.25MC 197.75MC	10		A17	
			189MC (30MC Swp)	187.25MC 191.75MC	9		A18	
			183MC (30MC Swp)	181.25MC 185.75MC	8		A19	
			177MC (30MC Swp)	175.25MC 179.75MC	7		A30	
			85MC (30MC Swp)	83.25MC 87.75MC	6		A31	
			79MC (30MC Swp)	77.25MC 81.75MC	5		A32	
			91MC (30MC Swp)	89.25MC 93.75MC	4		A33	
			83MC (30MC Swp)	81.25MC 85.75MC	3		A34	
			97MC (30MC Swp)	95.25MC 99.75MC	2		A35	

VHF RF AND MIXER ALIGNMENT

Connect bias as under "Video IF Alignment.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (30MC Swp)	12	Vert. Amp. thru 10KΩ to point (D). Low side to chassis.	A26, A27, A28	Adjust marker generator to provide readable marker. Be sure it does not distort the response curve. Adjust for response similar to Fig. 6.
12.	"	"	213MC (30MC Swp)	13	"		Check for response similar to Fig. 6 on all channels. If markers fall below 70% on any channel, make compromise adjustments of A26, A27 and A28 with channel switch set to that channel. Then recheck all other channels to see that they have not been seriously affected.
			201MC (30MC Swp)	11			
			195MC (30MC Swp)	10			
			189MC (30MC Swp)	9			
			183MC (30MC Swp)	8			
			177MC (30MC Swp)	7			
			85MC (30MC Swp)	6			
			79MC (30MC Swp)	5			
			91MC (30MC Swp)	4			
			83MC (30MC Swp)	3			
			97MC (30MC Swp)	2			

IF WAVE TRAP ADJUSTMENT

The IF wave trap should be tuned to minimize interference caused by signals which fall within the video IF band-pass (40-48MC). Tune in a station on which the interference is noted and adjust A29 for minimum interference in the picture.

UHF OSCILLATOR ALIGNMENT FOR UHF TUNER USED WITH VHF TUNER 470712

Connect bias as under "VHF Oscillator Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizonta. input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across UHF antenna terminals with 120Ω in each lead.	453MC (12MC Swp)	451.25MC (Video)	Tuning plates fully meshed (fully clockwise)	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A30	If separate UHF marker generator is used, couple it loosely to sweep generator terminals. Adjust to place video (451.25MC) marker at the 50% point on response curve.
14.	"	"	869MC (12MC Swp)	867.25MC (Video)	90	"	A31	Remove shield from side of UHF tuner. Adjust A31 to place video marker (867.25MC) at 50% on response curve. Use low marker generator output. Replace tuner shield.

UHF RF ALIGNMENT FOR UHF TUNER USED WITH VHF TUNER 470712

The RF portion has been properly aligned at the factory and is very stable. Alignment of this portion is not recommended in the field.

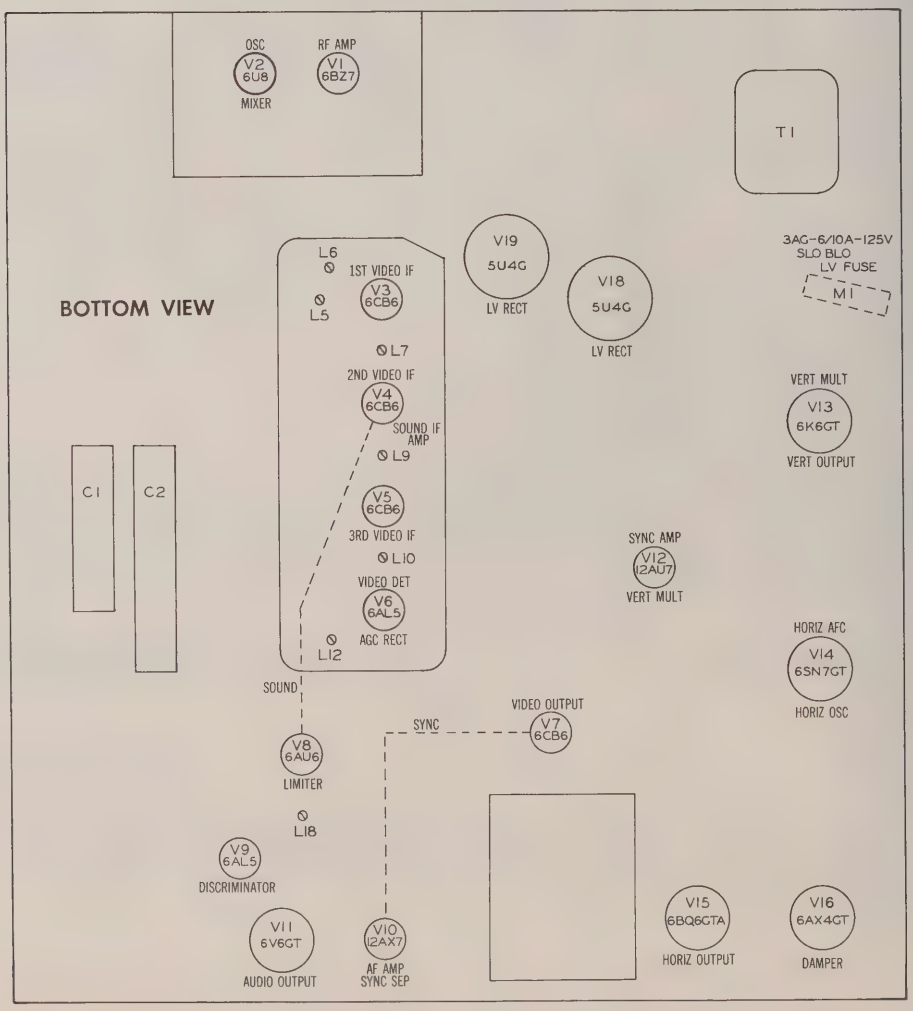
UHF TUNER ALIGNMENT FOR UHF TUNERS 470748, 470713 AND UHF-VHF TUNER 470712 COMBINATION

In the event the UHF oscillator tube is replaced, it is recommended that several tubes be tried and the one which works best should be used. Alignment of these tuners are not recommended in the field.

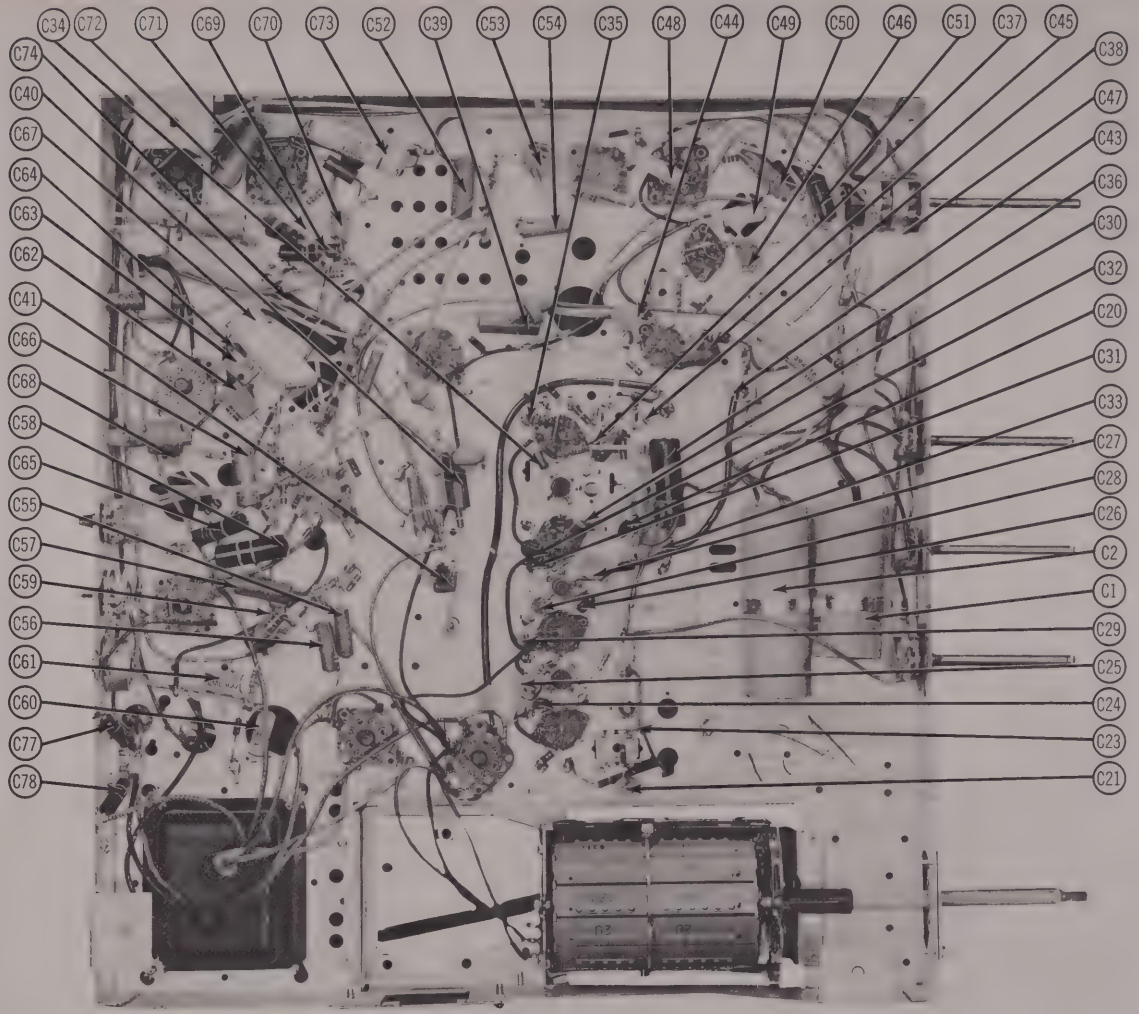
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BZ7	†2KΩ	300KΩ	INF	0Ω	.1Ω	INF	1.6Meg	0Ω	†2KΩ
V 2	6U8	†5KΩ	200KΩ	†100KΩ	.1Ω	0Ω	†8.7KΩ	0Ω	0Ω	10KΩ
V 3	6CB6	1.3Meg	68Ω	.1Ω	0Ω	†2KΩ	†2KΩ	0Ω		
V 4	6CB6	2.2Ω	47Ω	.1Ω	0Ω	†2KΩ	†17KΩ	0Ω		
V 5	6CB6	0Ω	180Ω	.1Ω	0Ω	†2KΩ	†2KΩ	0Ω		
V 6	6AL5	.1Ω	1Meg	.1Ω	0Ω	100KΩ	0Ω	4.7KΩ		
V 7	6CB6	1Meg	37Ω	0Ω	.1Ω	†7.3KΩ	†15KΩ	†15KΩ		
V 8	6AU6	220KΩ	0Ω	0Ω	.1Ω	†2KΩ	†22KΩ	0Ω		
V 9	6AL5	0Ω	100KΩ	.1Ω	0Ω	170KΩ	0Ω	100KΩ		
V 10	12AX7	†220KΩ	10Meg	0Ω	.1Ω	.1Ω	†11KΩ	2.3Meg	0Ω	0Ω
V 11	6V6GT	NC	.1Ω	†370Ω	†550Ω	470KΩ	TP	0Ω	470Ω	
V 12	12AU7	▲1.4Meg	1.3Meg	0Ω	.1Ω	.1Ω	†3.3KΩ	1Meg	2.7KΩ	0Ω
V 13	6K6GT	NC	0Ω	▲5.7KΩ	▲5.7KΩ	2.2Meg	TP	.1Ω	3.2KΩ	
V 14	6SN7GT	1.5Meg	†40KΩ	400KΩ	480KΩ	†47KΩ	0Ω	.1Ω	0Ω	
V 15	6BQ6GTA	NC	0Ω	TP	†5.2KΩ	470KΩ	NC	.1Ω	100Ω	TOP CAP ▲39Ω
V 16	6AX4GT	NC	NC	1Meg	NC	†90Ω	NC	0Ω	.1Ω	
V 17	1B3GT		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▲565Ω
V 18	5U4G	NC	25KΩ	NC	19Ω	NC	19Ω	NC	25KΩ	
V 19	5U4G	TP	25KΩ	TP	18Ω	TP	18Ω	NC	25KΩ	
V 20	17LP4/ 17VP4	0Ω	13Ω	PIN 6 †550Ω	PIN 10 ▲20Ω	PIN 11 †330KΩ	PIN 12 .1Ω			

†MEASURED FROM PIN 2 OF V19.
▲MEASURED FROM PIN 3 OF V16.
NC-NO CONNECTION.
TP-TIE POINT.



TUBE PLACEMENT CHART



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

PROPERTY OF
NSHIP

EMERSON (Ch. 120233-D, -F, 120234-D, 120235-D, 120236-D, 120237-D, 120238-D, -F, -H, 120241-D, -F, 120249-D, -F)

ALTERNATE UHF-VHF TUNER SCHEMATIC

UHF-VHF TUNER PART NO. 470738 USED WITH CHASSIS 120234-D AND 120236-D

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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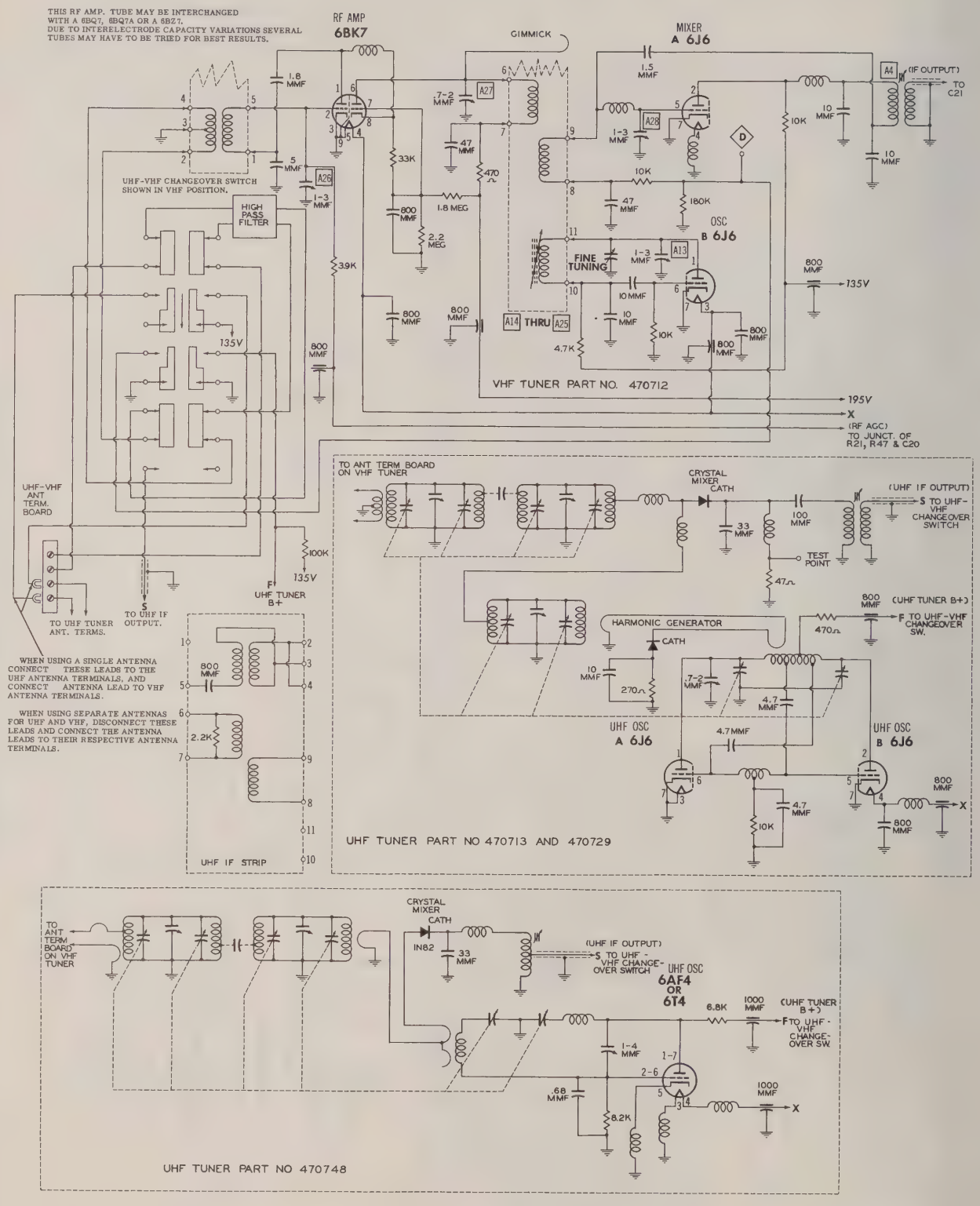
PROPERTY OF U.S. SHIPPING BOARD
BOULDER, COLORADO


THIS RF AMP. TUBE MAY BE INTERCHANGED WITH A 6BQ7, 6BQ7A OR A 6BZ7. DUE TO INTERELECTRODE CAPACITY VARIATIONS SEVERAL TUBES MAY HAVE TO BE TRIED FOR BEST RESULTS.
RF AMP 6BK7
GIMMICK
MIXER A 6J6
OSC B 6J6
UHF-VHF CHANGEOVER SWITCH SHOWN IN VHF POSITION.
HIGH PASS FILTER
FINE TUNING
A14 THRU A25
VHF TUNER PART NO. 470712
195V
X
(RF AGC) TO JUNCT. OF R21, R47 & C20
(IF OUTPUT) TO C21
135V
UHF-VHF ANT. TERM. BOARD
TO UHF TUNER ANT. TERMS.
TO UHF IF OUTPUT.
F UHF TUNER B+
WHEN USING A SINGLE ANTENNA CONNECT THESE LEADS TO THE UHF ANTENNA TERMINALS, AND CONNECT ANTENNA LEAD TO VHF ANTENNA TERMINALS.
WHEN USING SEPARATE ANTENNAS FOR UHF AND VHF, DISCONNECT THESE LEADS AND CONNECT THE ANTENNA LEADS TO THEIR RESPECTIVE ANTENNA TERMINALS.
UHF IF STRIP
TO ANT TERM BOARD ON VHF TUNER
CRYSTAL MIXER CATH
(UHF IF OUTPUT) S TO UHF-VHF CHANGEOVER SWITCH
TEST POINT
(UHF TUNER B+) F TO UHF-VHF CHANGEOVER SW.
HARMONIC GENERATOR
UHF OSC A 6J6
UHF OSC B 6J6
UHF TUNER PART NO 470713 AND 470729
TO ANT. TERM BOARD ON VHF TUNER
CRYSTAL MIXER CATH
IN82
(UHF IF OUTPUT) S TO UHF - VHF CHANGE-OVER SWITCH
UHF OSC 6AF4 OR 6T4
(UHF TUNER B+) F TO UHF - VHF CHANGE-OVER SW.
UHF TUNER PART NO 470748

UHF TUNER PART NO. 470748 AND VHF TUNER PART NO. 470172, USED WITH CHASSIS 120238-H

UHF TUNER PART NO. 470713 AND VHF TUNER PART NO. 470712 USED WITH CHASSIS 120238-F AND 120249-D

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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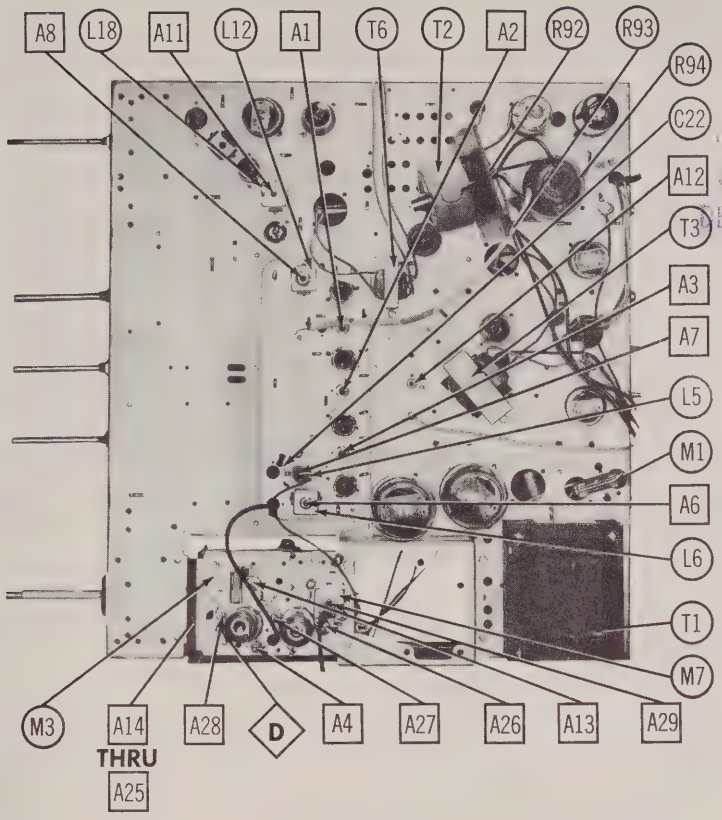
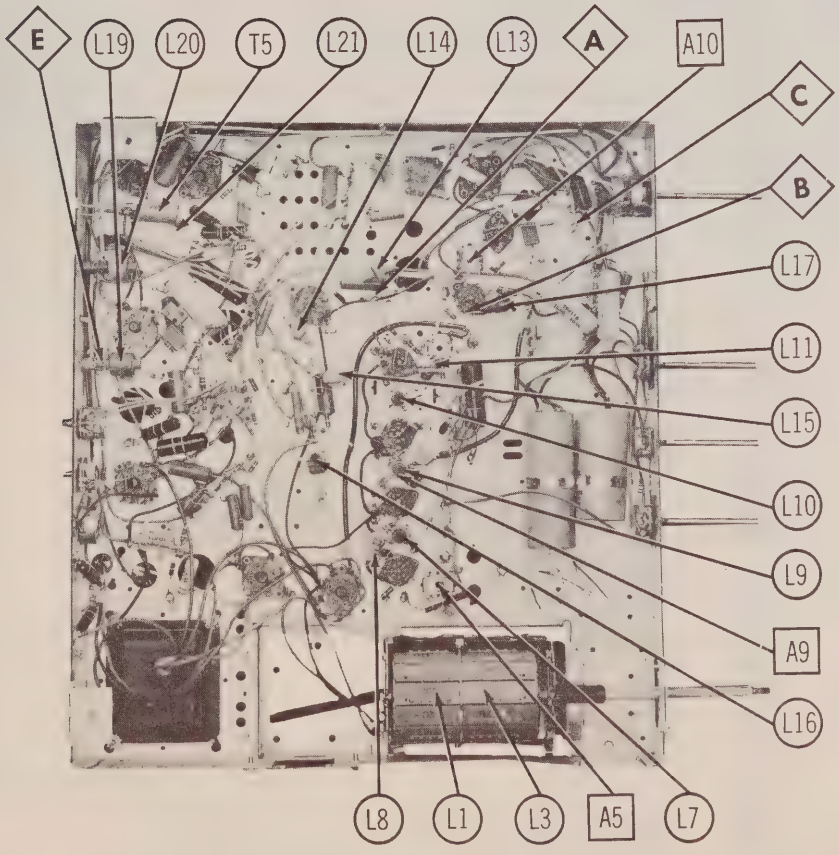
ALTERNATE UHF-VHF TUNER SCHEMATIC

DENVER, COLORADO



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

SET 304 FOLDER 7

EMERSON (Ch. 120233-D, -F, 120234-D, 120235-D, 120236-D, 120237-D, 120238-D, -F, -H, 120241-D, -F, 120249-D, -F)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No	USE	REPLACEMENT DATA: EMERSON PART No.	STANDARD REPLACEMENT	RETMA BASE TYPE
V1	RF Amplifier	8BZ7	8BZ7	9AJ
V2	Mixer-Osc.	6U8	6U8	9AE
V3	1st. Video IF Amp.	6CB6	6CB6	7CM
V4	2nd. Video IF Amp. Sound IF Amp.	6CB6	6CB6	7CM
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM
V6	Video Det.- AGC Rectifier	6AL3	6AL5	6BT
V7	Video Output	6CB6	6CB6	7CM
V8	Limiter	6AU6	6AU6	7BK
V9	Discriminator	6AL3	6AL5	6BT
V10	AF Amplifier- Sync Separator	12AX7	12AX7	9A
V11	Audio Output	6V6GT	6V6GT	7S
V12	Sync Amplifier- Vert. Mult.	12AU7	12AU7	9A
V13	Vert. Mult.- Vert. Output	6X8GT	6X8GT	7S
V14	Horiz. AFC- Horiz. Osc.	6ENTGT	6ENTGT	8BD
V15	Horiz. Output	6BQ6GTA	6BQ6GTA	6AM
V16	Damper	6AX4GT	6AX4GT	4CG
V17	HV Rectifier	1B3GT	1B3GT	3C
V18	LV Rectifier	5U4G	5U4G	5T
V19	LV Rectifier	5U4G	5U4G	5T

CATHODE-RAY TUBE

ITEM No	REPLACEMENT DATA: EMERSON PART No	CBS	GENERAL ELECTRIC	SYLVANIA	WESTINGHOUSE	RETMA BASE TYPE	NOTES
V20	21YP4	17LP4/ 17YP4	17LP4/17YP4	17LP4/ 17YP4	17LP4/17YP4	12L	① Aluminized ② Silver screen
	21YP4A ① 21YP4	17LP4A ② 17YP4A ②	21YP4A ②	21YP4A ② 21YP4	21YP4A ② 21YP4	12L 12L	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	VOLT.	REPLACEMENT DATA: EMERSON PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	NOTES
C1A	80	300	925390	FP368.3	TM-3040	T-830	
B	10	350					
C	100	50					
C1A	80	300	932345	FP375.5		Q-012	
B	40	350		TC72		MT-4810	
C	40	350					
D	10	450					

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT.	REPLACEMENT DATA: EMERSON PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	NOTES
C3	3-9		961033	829-10	501-001	DC-521	
C4	1000			DD-102	501-001	DC-521	
C5	3		960587	TC2-3N3	MPOA-3R3	ZT-5535	
C6	.5-3		960634	829-3	3115-01-GR5	CT565A	
C7	800		960436				
C8	1.5			TC2-1R5	MPOA-1R5	ZT-5515	
C9	47			DD-470	831-470	UC-5647	
C10	47		960597	MPT-50			
C11	.5-3		960634	829-3	3115-01-GR5	CT565A	
C12	5						
C13	30						
C14	.5-3		960634	829-3	3115-01-GR5	CT565A	
C15	800		960436				
C16	220			DD-221	831-221	UC-5322	
C17	1000			DD-102	501-001	DC-521	
C18	800		960436				
C19	800		960436				
C20	1000		928077	DD-102	501-001	DC-521	
C21	5000		928109	DD-502	811-005	DC-525	
C22	39		928082	TCN-39	NT50K-390		
C23	1000		928077	DD-102	501-001	DC-521	
C24	680		928076	DD-681	811-681	UC-5368	
C25	51		928085	TCN-100	NT50L-101	KT-531	
C26	47		928000-1	D6-470	GP1K-470	UC-5447	
C27	5000		928109	DD-502	811-005	DC-525	
C28	470		928081	DD-471	831-471	UC-5347	
C29	1000		928077	DD-102	501-001	DC-521	
C30	680		928076	DD-681	811-681	UC-5368	
C31	680		928076	D6-681	GP2K-681	UC-5368	
C32	1000		928077	DD-102	501-001	DC-521	
C33	1000		928077	DD-102	501-001	DC-521	
C34	680		928076	D6-681	GP2K-681	UC-5368	
C35	1000		928077	DD-102	501-001	DC-521	
C36	.33	300	932325			PT4023	
C37	5		928017	D6-050	GP1K-050	ZT-555	
C38	47		928000-1	TC8-47	NT50K-470	UC-5447	
C39	.047	400	932554	DF-503		PT4147	
C40	.047	400	932554	DF-503		PT4147	
C41	47			TC2-47	NP0-33S-470	UC-5447	
C42	.001	600	932713	D6-102	GP2L-102	PT631	Note 1
C43	100		928098	DD-101	811-001	DC-521	
C44	5000		928109	DD-502	811-005	DC-525	
C45	5000		928109	DD-502	811-005	DC-525	
C46	100	500	931858	D6-101	GP1K-101	MC3135	
C47	.0022	400	932533	D6-222	GP2J-333-222	PT6223	
C48	.0033	400	932533	D6-332	GP2J-333-332	PT6233	
C49	.001	400	932519	D6-102	GP2L-102	PT631	
C50	.047	400	932554	DF-503		PT4147	
C51	.01	600	932716	D6-103	GP2J-333-103	PT611	
C52	.047	400	932554	DF-503		PT4147	
C53	220	500	931184	DF-221	GP2K-221	UC-5322	
C54	.01	400	932514	D6-103	GP2J-333-103	PT611	
C55	.0022	400	932533	D6-222	GP2J-333-222	PT6223	
C56	.0082	400	932538	D6-822	GP2J-333-822	PT6323	
C57	.047	400	932454				
C58	.1	400	932515	DF-104		PT631	

PARTS LIST AND DESCRIPTIONS
CAPACITORS (cont)

ITEM No	RATING: CAP.	VOLT.	REPLACEMENT DATA: EMERSON PART No	CENTRALAB PART No	ERIE PART No	MALLORY PART No	NOTES
C59	.0047	400	932453			MC3645	
C60	.001	600	932713	D6-102	GP2L-102	PT631	
C61	.01	600	932716	D6-103	GP2-333-103	PT611	
C62	82	500	931160	D6-820	801-820		
C63	82	500	931160	D6-820	801-820		
C64	.047	400	932554	DF-503		PT4147	
C65	.022	400	932534	DF-303	811-02	PT4123	
C66	.047	400	932554	DF-503		PT4147	
C67	.47	200	932355			PT4047	
C68	330	500	931157	D6-331	831-331		
C69	.01	600	932614				
C70	820	500	931173		831-831		
C71	.001	400	932413	D6-102	GP2L-102	PT631	
C72	.1	600	932515	DF-104		PT401	
C73	.22	200	932325			PT4023	
C74	.1	400	932715	DF-104		PT401	
C75	100	4000	928114	DD60-101			Note 2
C76	50	2000	928097	DD30-500			
C77	.01	400	932301	DD-103	GP2-333-103	PT611	
C78	.01	400	932301	DD-103	GP2-333-103	PT611	

Note 1. Not used in chassis coded ⚠.
Note 2. Used only with horizontal output transformer part #738086.

CONTROLS

ITEM No.	RATING: RESIST-ANCE	WATTS	REPLACEMENT DATA: EMERSON PART No	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1500Ω	1	390201	F1-7	RTV-196	QJ-315*	UF152L	Contrast (Panel)
B	1Meg			R2-52			UR16A) *	Volume (Rear) Attach to R1A.
C	Switch			KB-1			US-26)	Attach to R1B.
R2A	200KΩ	½	390207	AB-46	A47-200K-S	QJ1-139	U-43	Brightness
B	Shaft		Not Req.	AK-4	Not Req.	Not Req.	Not Req.	Attach to R2A.
R3A	1Meg	½	390299	AB-59	A47-1Meg-S	QJ1-127	U-56	Vertical Hold
B	Shaft		Not Req.	AK-4	R3-3	Not Req.	U-35	Attach to R3A
R4A	50KΩ	½	390298	AB-3L	A47-50K-S	QJ1-123	U-35	Horizontal Hold
B	Shaft		Not Req.	AK-4	R3-3	Not Req.	Not Req.	Attach to R4A.
R5	5000Ω	2	390327		R4-5000 †	WK-5000 †	R5000L †	Vertical Linearity-Stop at 1000Ω
R6A	2Meg	½	390228	BX-75	A47-2Meg-S	QJ1-159	TA28L	Vertical Size-See Note 1
B	Shaft		Not Req.	FX8-1/4	Not Req.	Not Req.	Not Req.	Attach to R6A.
R6A	2Meg	½	390196	BX-75	A47-2Meg-S	QJ1-159	TA28L	Vertical Size-See Note 1
B	Shaft		Not Req.	FX8-1/4	Not Req.	Not Req.	Not Req.	Attach to R6A.
R7A	2Meg	½	390288	BX-75	A47-2Meg-S	QJ1-159	TA28L	Vertical Size-See Note 1
B	Shaft		Not Req.	Not Req.	FX8-1/4	Not Req.	Not Req.	Attach to R6A.
R7A	50KΩ	½	390232	AB-3L	A47-50K-S	QJ1-123	U-35	Picture Stabilizer-See Note 2
B	Shaft		Not Req.	AK-1	FX8-1/4	Not Req.	Not Req.	Attach to R7A.

Note 1. Used in some versions.
Note 2. Controls 390289, 390132, 390119, used in some versions.
★ CONCENTRIBIT EQUIVALENT: K-2 KIT, BASE ELEMENTS AND SHAFTS: B17-1U0, P1-224 (Panel) B13-137, R1-308 (Stem) T6-1 Switch

* Universal Replacement (Mallory Exact Duplicate Part No. UR26SH)
† Connect a 1000Ω resistor in series with control terminal.

RESISTORS

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: EMERSON PART No	IRC PART No.	NOTES
R8	22KΩ	½		BTS-47K	
R9	47KΩ	½		BTS-47K	
R10	470Ω	½		BTS-470K	
R11	820KΩ	½		BTS-820K	
R12	150Ω	½		BTA-1500	
R13	8500Ω	½			
R14	100KΩ	½			
R15	100KΩ	½			
R16	10KΩ	½			
R17	3300Ω	½		BTS-3300	
R18	100KΩ	½			
R19	15KΩ	½			
R20	9300Ω	½			
R21	470KΩ	½	541122	BTS-470K	
R22	15Ω	½	340052	BTS-15Ω	
R23	1000Ω	½	340492	BTS-1000	
R24	15KΩ	½	340772	BTS-470	
R25	470Ω	½	340413	BTS-470	
R26	68Ω	½	340512	BTS-68	
R27	15KΩ	½	340772	BTS-470	
R28	470Ω	½	339413	BTS-470	
R29	47Ω	½	340172	BTS-47	
R30	5600Ω	½	340672		
R31	470Ω	½	340413	BTS-470	
R32	180Ω	½	340312	BTS-180	
R33	1000Ω	½	350972	BTS-100K	
R34	330KΩ	½	341092	BTS-330K	
R35	1Meg	½	351212	BTS-1Meg	
R36	15KΩ	½	340772	BTS-15K	
R37	15KΩ	½	340772	BTS-15K	
R38	4700Ω	½	340852	BTS-4700	
R39	1Meg	½	351212	BTS-1Meg	
R40	15KΩ	1	3107T2	BTA-15K	
R41	680Ω	3	780692	BTA-680	
R42	15KΩ	½	350772	BTS-15K	
R43	2.2MΩ	½	352123	BTS-2.2Meg	
R44	470KΩ	½	351122	BTS-470K	Note !
R45	220KΩ	½	351052	BTS-220K	
R46	30KΩ	½	341072	BTS-30K	
R47	10Meg	½	351452	BTS-10Meg	
R48	22KΩ	1	370423	BTA-22K	
R49	47ΩΩ	2	350432	BTS-47K	
R50	100KΩ	½	340972	BTS-100K	
R51	100KΩ	½	340972	BTS-100K	
R52	68KΩ	½	350932	BTS-68K	
R53	10Meg	½	351452	BTS-10Meg	

Note 1. Not used in chassis coded ⚠.
Note 2. Used only in chassis coded ⚠; When this resistor is used, R7 (Picture Stabilizer Control) is a 200K.
Note 3. A single 47000 2W resistor used in some versions in this application.
Note 4. Some versions use a 33Ω ½W resistor in this application.

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: EMERSON PART No	IRC PART No.	NOTES
R54	220KΩ	½	351052	BTS-220K	
R55	470KΩ	½	351132	BTS-470K	
R56	47KΩ	½	370412	BTA-470	
R57	220KΩ	½	341052	BTS-220K	Note 2
R58	100KΩ	½	350972	BTS-100K	
R59	2.2MEg	½	352192	BTS-2.2Meg	
R60	30KΩ	½	340732	BTS-30K	
R61	1Meg	½	351312	BTS-1Meg	
R62	150KΩ	½	340532	BTS-1500	
R63	1200Ω	½	340512	BTS-1200	
R64	1500Ω	½	340532	BTS-1500	
R65	10KΩ	½	350732	BTS-10K	
R66	820KΩ	½	341092	BTS-820K	
R67	30KΩ	½	340732	BTS-30K	
R68	22KΩ	½	340812	BTS-22K	
R69	470KΩ	½	341132	BTS-470K	
R70	2.2Meg	½	352192	BTS-2.2Meg	
R71	68Ω	½	350212	BTS-68	
R72	220KΩ	½	341052	BTS-220K	
R73	150KΩ	½	341012	BTS-150K	
R74	56KΩ	½	340432		
R75	560Ω	½	340432		
R76	4700Ω	2	790652	BTB-4700	
R77	330KΩ	½	341092		
R78	820KΩ	½	341132		
R79	150KΩ	½	341012		
R80	82KΩ	½	340852		
R81	39000	½	340832		
R82	150KΩ	½	341012		
R83	330KΩ	½	341092		
R84	4700Ω	½	340752		
R85	330Ω	½	341032		
R86	47KΩ	½	340932		
R87	470KΩ	½	341132		
R88	68Ω	½	350212		
R89	10KΩ	½		BTS-10K	Note 3
R90	10KΩ	½		BTB-10K	Note 3
R91	100Ω	1	790252	BTA-100	
R92	100Ω	1	340733		
R93	15Ω	½		BTS-15	
R94	0.5Ω	3	394143	RW1-.5	
R95	800Ω	10	394138	PW10-75	
R96	47ΩΩ	3	780413	BTB-470	
R97	12500	10	394116	PW10-1250	
R98	100KΩ	½	380577	BTA-100K	

TRANSFORMER (POWER)

ITEM No.	RATING: PRI	SEC 1	SEC 2	REPLACEMENT DATA: EMERSON PART No	Halldorson PART No.	Merit PART No	RCA TYPE No.	Stancor PART No	Thordarson PART No	Triad PART No
T1	117VAC	460VCT	5VAC	730052					26R33 ⚠	
	3.1.5A	.240ADC	2.6A							
	SEC 3	SEC 4	SEC 5							
	6.3VCT 3.4A									

⚠ Use low taps on 2V Sec., tape other taps. Series 6.3V windings for Sec. 3, parallel and phase 5V winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	Halldorson PART No.	Merit PART No	RCA TYPE No.	Sam PART No.	Stancor PART No.	Thordarson PART No	Triad PART No
T2	Horiz. Output Trans.	738100 738098 ③	FB437 *				A-8139 *		
T3	Vert. Output Trans.	738097	21803	A-3035	2047X ①	V309	A-8143X ①	28R51	A-90X
T4A	Yoke-Horiz.(94Ω)	708211	DF505 ②	MDF-73 ②	225D ②	YDP30.43 ③	DY-11A ②	Y-10 ②	Y-19-1 ②
B	Vert.(37.5Ω)								
T5	Width Coil(5.8Ω)	708088		MWC-8 ①	21HR1	203R15	WC-8	WC-18 ③	WC-12 ④

① Drill new mounting hole(s).
② Use original horizontal yoke damping network.
③ Enlarge mounting hole.
④ Connect to coded blue and green terminals.
⑤ Alternate Emerson part number.

***HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA**
Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Sam Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
4	4				4		
8	8				8		
7	7				7		
2	2				2		
5	5				5		
1	1						
5 & 1	5 & 1				5 & 1		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC	REPLACEMENT DATA: EMERSON PART No	Halldorson PART No.	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T6	5.1kΩ	8Ω	734088	S2000 ①	A-3026	A-3577 ①	24S51 ①	S-3X ①	⚠ Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V C	IMP	REPLACEMENT DATA: EMERSON PART No	QUAM PART No	NOTES
SP1	4"	PM	3.2Ω		180LU ①	4A07	⚠ Used in Models 1019H, 1017J, 1016D, 1067D, 1067J, 1065D, 1059D, 1070D, 1070J, 1071F, 1072D, and 1072J.
	5"	PM	3.2Ω		180122 ②	5A01	① Used in Models 1050D, 1051D, 1094D, and 1096D.
	6"	PM	3.2Ω		180095 ③	6A01	② Used in Models 1021H, 1004H, 1006H, 1008H, 1009J, 1011J, 1015H, 1020H, 1036H, 1040H, 1041F, 1041H, 1043H, 1043F, 1044D, 1046D, 1046F, 1074D, 1075D, 1076F, 1078H, 1084D, 1085D, 1088F, 1088H, 1089D, 1087D, 1087F, 1088D, 1089D, 1089F, 1090D, 1091D, 1091F, 1092D, 1093D, 1093F, 1095D, and 1095J.
	8"	PM	3.2Ω		180106 ④	8A01	③ Alternate 6" PM speaker.
	12"	PM	3.2Ω		180120 ⑤	12A31	④ Used in models 1041D, 1045D, 1045F, 1045H, 1046D, 1047D, 1047F, 1054D, 1055D, 1055F, 1056D and 1057D.

COILS (RF-IF)

ITEM No.	USE	DC RES: PRI	SEC	REPLACEMENT DATA: EMERSON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coils	0Ω	0Ω					
L2	Neut. Coil	0Ω						
L3	RF Mixer Grid Osc. Coils	0Ω						
L4	Conv. Plate	.2Ω	0Ω	981018			6219 ⑤	
L5	4.5MSC Trap	0Ω		730154	20-1047*		6219 ⑤	
L6	1st Video IF	.1Ω		722201	17-5004	TV-125	6233 ⑤	Includes 4L 2SMC Trap
L7	2nd Video IF	.1Ω	.1Ω	720175	17-4523	TV-130	6219	
L8	RF Coil	.1Ω	2Ω	705023	19-1001		4604	1.5 Microhenries, IRC Part No. C1A
L8A	3rd Video IF	.1Ω	0Ω	720181				
B	2nd Sound IF	1.1Ω						
L10	4th Video IF	.1Ω	.1Ω	720175	17-4523	TV-130	6219	
L11	Series Peaking Coil	1.1Ω		702209	19-1003		4605	4.5 Microhenries
L12	1st Sound IF	10.5Ω	.9Ω	720178	19-2445	TV-113	6233	
L13	Shunt Peaking Coil	12Ω		708214	19-4400		6138	440 Microhenries
L14	Series Peaking Coil	11Ω		708200	19-3250	TV-185	6181	250 Microhenries
L15	Shunt Peaking Coil	20Ω		708215	19-3980		6148	680 Microhenries
L16	4.5MC Trap	2.1Ω		708164	20-1004	TV-151	1452	
L17	RF Coil	1.1Ω		708209	19-1003		4604	4.5 Microhenries
L18	Discriminator	4.2Ω	4.2Ω	708210	17-1023 ⑥	TV-114	6204	
L19	Horiz. Osc.	55Ω	85Ω	708083	20-1402 ⑥	TV-162 ⑥	6313	
L20	Horiz. Phase	2.9Ω		708180	20-1402 ⑥	TV-162 ⑥	6314	
L21	RF Choke	8.2Ω		705021	19-1005		4612	10 Microhenries

* Discontinued 23SMMF Cap.
■ Use one winding only.
⚠ Enlarge chassis hole & drill mounting holes.
★ Horiz. Osc. & Horiz. Phase Coils replaced with one unit. Cut out chassis hole & drill mounting holes. Reverse coil mounting in can.

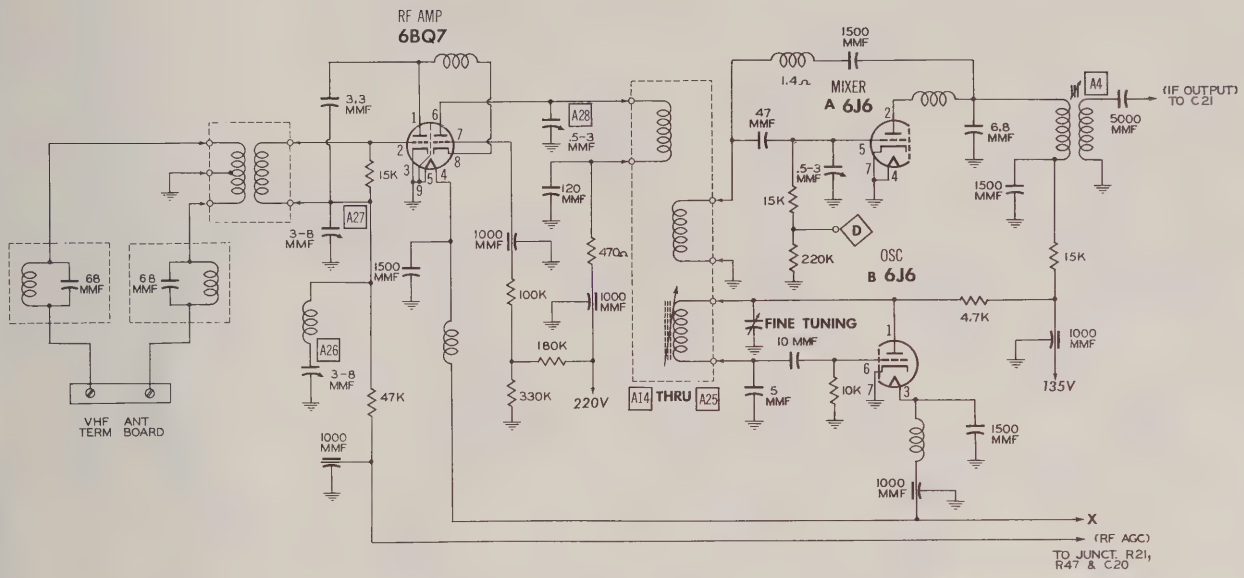
PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			EMERSON PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG S/B	6/10A 125V	808005		313. 600 (3AG S/B 6/10A)	357001	MDL 6/10	4405

MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M2	Dial Light	807000	#47-Chassis 120234-D, 120236-D, 120237-D, 120238-D, 120249-F, 120238-F, 120249-D, 120238-H
M3	Tuner	470770	VHF-Chassis 120233-D, 120233-F, 120235-D, 120241-D, 120241-F; Alternate Part Nos. 470696 & 470772
	Tuner	470712	VHF-Chassis 120238-F, 120249-D, 120238-H
M4	Tuner	470738	UHF-VHF-Chassis 120234-D, 120236-D
	Tuner	470774	UHF-VHF-Chassis 120237-D, 120238-D, 120249-F
M5	Tuner	470713	UHF-Chassis 120238-F, 120249-D
	Tuner	470748	UHF-Chassis 120238-H
M6	Trap	720173	VHF Ant. Input Filter-Chassis 120238-F, 120249-D
	Trap	720176	VHF Ant. Input Filter-Chassis 120238-H
M7	Trap		VHF Ant. Input Filter-Chassis 120233-D, 120233-F, 120235-D, 120241-D, 120241-F, 120234-D, 120236-D, 120237-D, 120238-D, 120249-F
M8	Switch	960703	UHF-VHF-Chassis 120238-F, 120249-D, 120238-H
M9	Centering Device	708149	Alternate Part No. 708134
M10	Ion Trap	708129	
	Cabinet	140571	Model 1002H
	Cabinet	140571E	Model 1004H
	Cabinet	140571D	Model 1006H
	Cabinet	140571B	Model 1008H
	Cabinet	140582B	Model 1009J
	Cabinet	140582C	Model 1011J
	Cabinet	140589	Models 1012H, 1012J
	Cabinet	140589A	Model 1014J
	Cabinet	140573	Model 1018H
	Cabinet	140573A	Model 1020H
	Cabinet	140600	Model 1036H
	Cabinet	140624	Model 1040H
	Cabinet	140605	Models 1041F, 1041H
	Cabinet	140624A	Model 1042H
	Cabinet	140605A	Model 1043H
	Cabinet	140618	Model 1044D
	Cabinet	140622	Models 1045D, 1045F, 1045H
	Cabinet	140618A	Model 1046D
	Cabinet	140622A	Models 1047D, 1047F
	Cabinet	140619	Models 1048D, 1049F, 1049D
	Cabinet	140628	Models 1050D, 1051D
	Cabinet	140620	Model 1054D
	Cabinet	140623	Models 1055D, 1055F, 1055H
	Cabinet	140620A	Model 1056D
	Cabinet	140623A	Model 1057D
	Cabinet	140614	Models 1066D, 1067D, 1067F
	Cabinet	140614A	Models 1068D, 1069D
	Cabinet	140615	Models 1070D, 1071D, 1071F
	Cabinet	140615A	Models 1072D, 1073D
	Cabinet	140621	Model 1074D
	Cabinet	140625	Models 1075D, 1075F, 1075H
	Cabinet	140630	Models 1084D, 1085D, 1085F, 1085H
	Cabinet	140630A	Models 1086D, 1087D, 1087F
	Cabinet	140630B	Models 1088D, 1089D, 1089F
	Cabinet	140630C	Models 1090D, 1091D, 1091F
	Cabinet	140630D	Models 1092D, 1093D, 1093F
	Cabinet	140637	Models 1098D, 1099D
	Cabinet	140608	Models 1100D, 1101D
	Mask	565273	Dial - Models 1041F, 1045F, 1047F, 1051D, 1055F, 1075F, 1085F, 1075H
	Mask	460527A	Picture tube - Models 1002H, 1004H, 1006H, 1008H, 1009J, 1011J, 1018H, 1020H, 1048D, 1049F
	Mask	460476A	Picture tube - Model 1012H
	Mask	460638A	Picture tube - Models 1012J, 1014J
	Mask	460524A	Picture tube - Model 1036H
	Mask	460624A	Picture tube - Models 1049D, 1040H, 1041F, 1041H, 1042H, 1043F, 1044D, 1045D, 1045F, 1045H, 1046D, 1047D, 1047F, 1050D, 1051D, 1054D, 1055D, 1055F, 1055H, 1056D, 1057D, 1099D
	Mask	460601	Picture tube - Models 1066D, 1067D, 1067F, 1068D, 1069D
	Mask	460604	Picture tube - Model 1070D, 1071D, 1071F, 1072D, 1073D
	Mask	460605	Picture tube - Models 1074D, 1075D, 1075F, 1075H
	Mask & Frame Assy	460620	Picture tube - Models 1084D, 1085D, 1085F, 1085H, 1086D, 1087D, 1087F, 1088D, 1089D, 1089F, 1090D, 1091D, 1091F, 1092D, 1093D, 1093F
	Mask & Frame Assy.	460620B	Picture tube - Models 1100D, 1101D
	Safety Glass	520205	Models 1002H, 1004H, 1006H, 1008H
	Safety Glass	520197	Models 1009J, 1011J
	Safety Glass	520202	Models 1012H, 1012J, 1014J
	Safety Glass	520206	Models 1018H, 1020H, 1036H, 1048D, 1049F
	Safety Glass	520213	Models 1049D, 11040H, 1041F, 1041H, 1042H, 1043D, 1044D, 1045D, 1045F, 1045H, 1046D, 1047D, 1047F, 1050D, 1051D, 1054D, 1055D, 1055F, 1055H, 1056D, 1057D, 1098D, 1099D
	Safety Glass	520207	Models 1066D, 1067D, 1067F, 1068D, 1069D
	Safety Glass	520209	Models 1070D, 1071D, 1071F, 1072D, 1073D
	Safety Glass	520215	Models 1074D, 1075D, 1075F, 1075H
	Safety Glass	520218	Models 1084D, 1085D, 1085F, 1085H, 1086D, 1087D, 1087F, 1088D, 1089D, 1089F, 1090D, 1091D, 1091F, 1092D, 1093D, 1093F, 1100D, 1101D



VHF TUNER PART NO. 470696 USED IN SOME VERSIONS VHF ONLY CHASSIS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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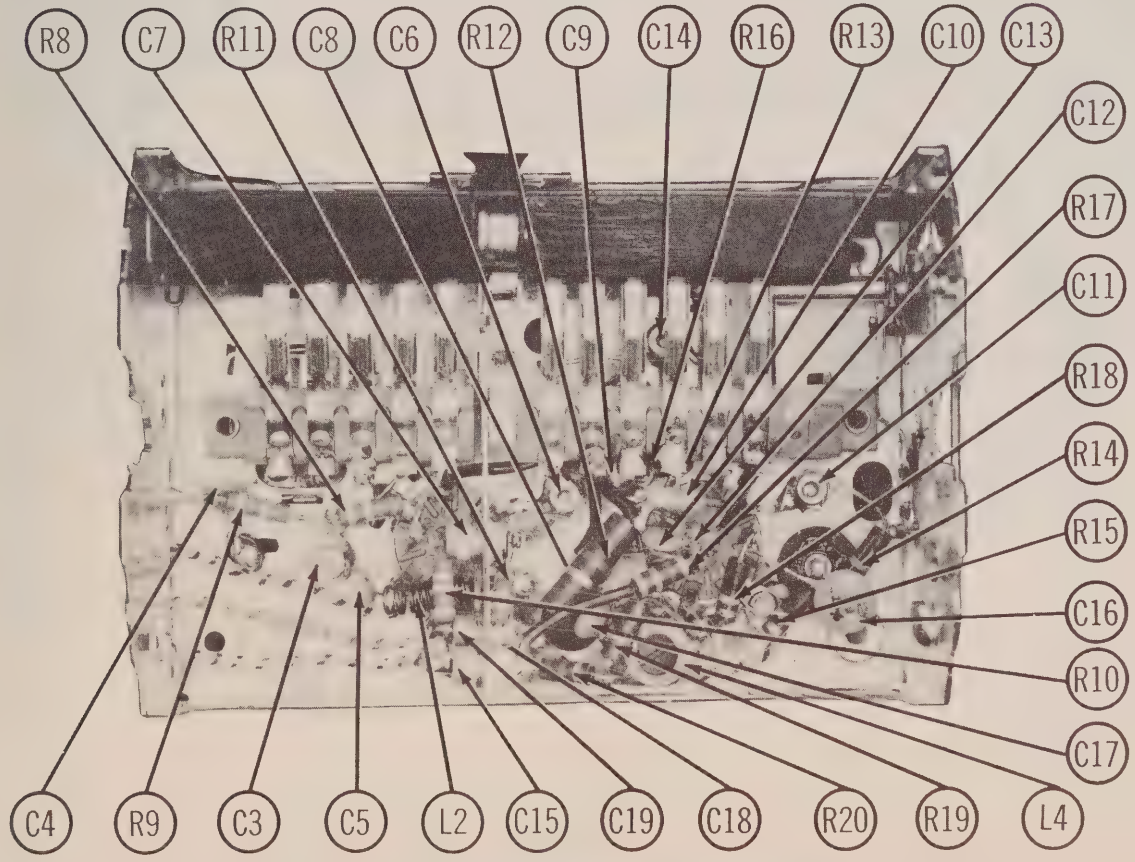
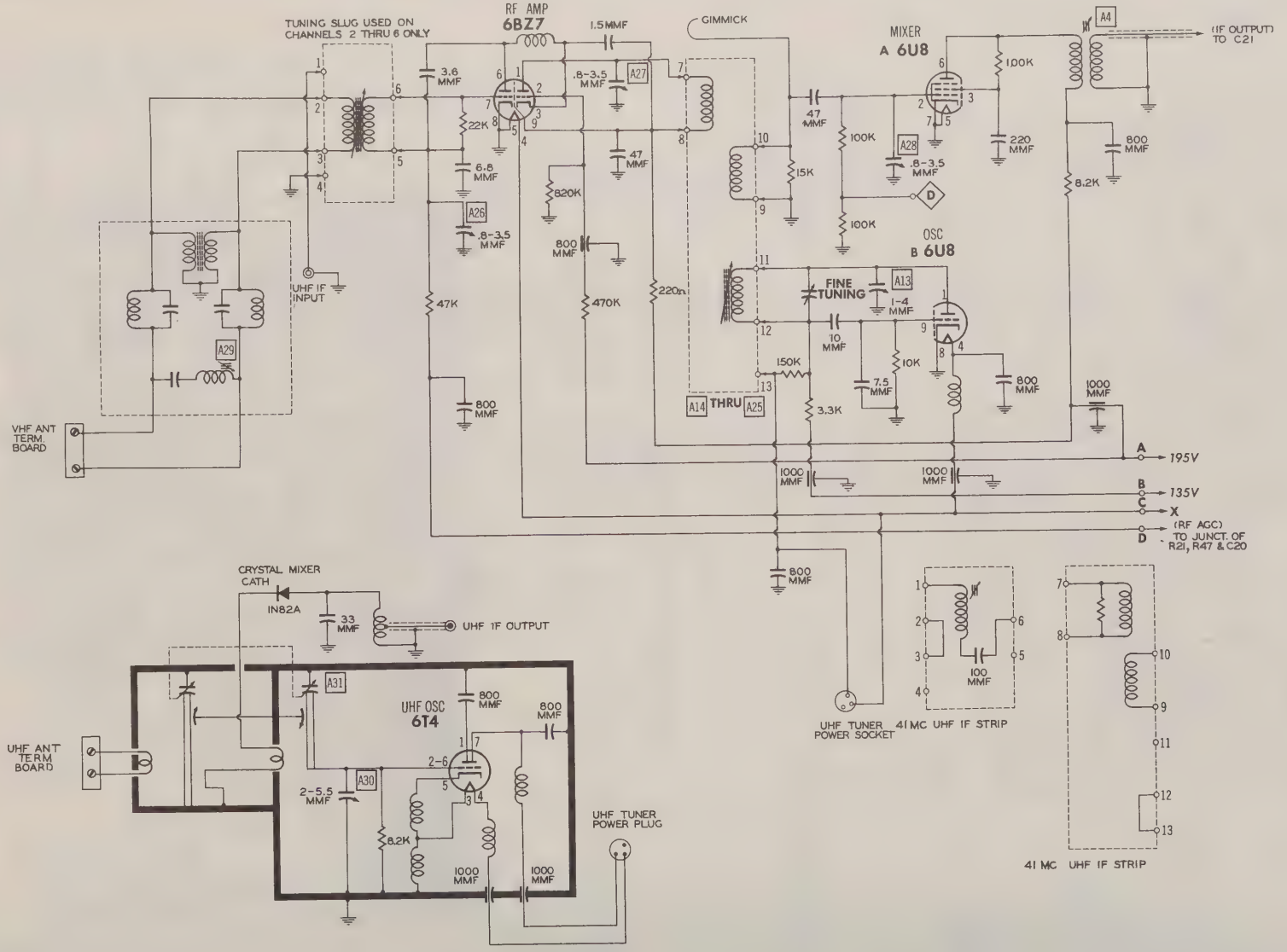
DENVER, COLORADO

ALTERNATE VHF TUNER SCHEMATIC



RF TUNER-BOTTOM VIEW



UHF-VHF TUNER PART NO. 470774 USED WITH CHASSIS 120237-D, 120238-D, AND 120249-F

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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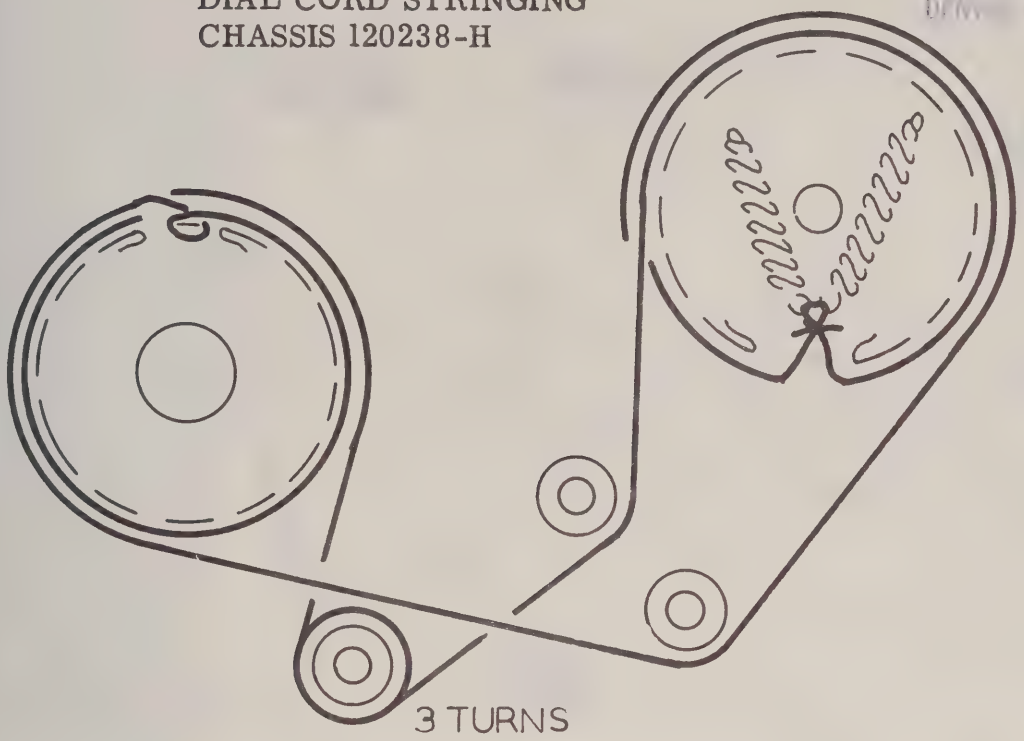
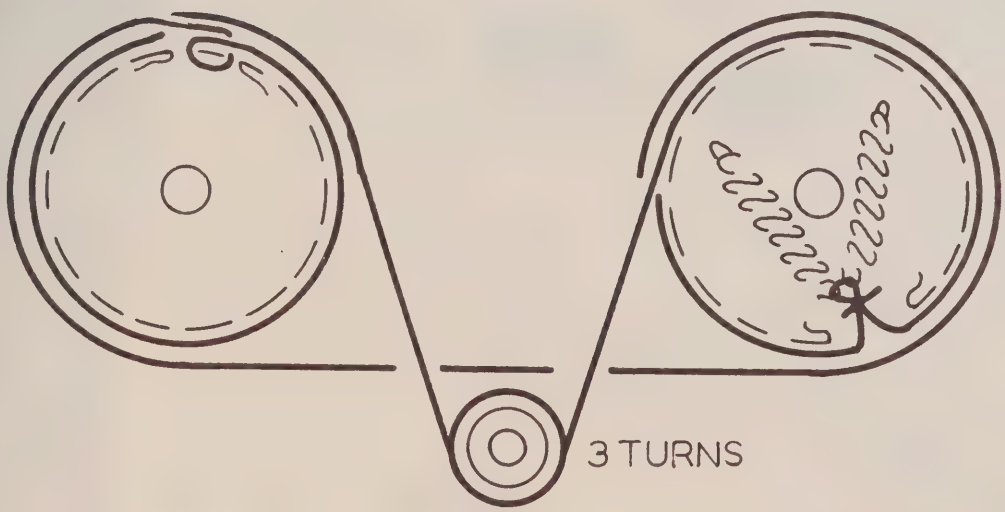
ALTERNATE UHF-VHF TUNER SCHEMATIC

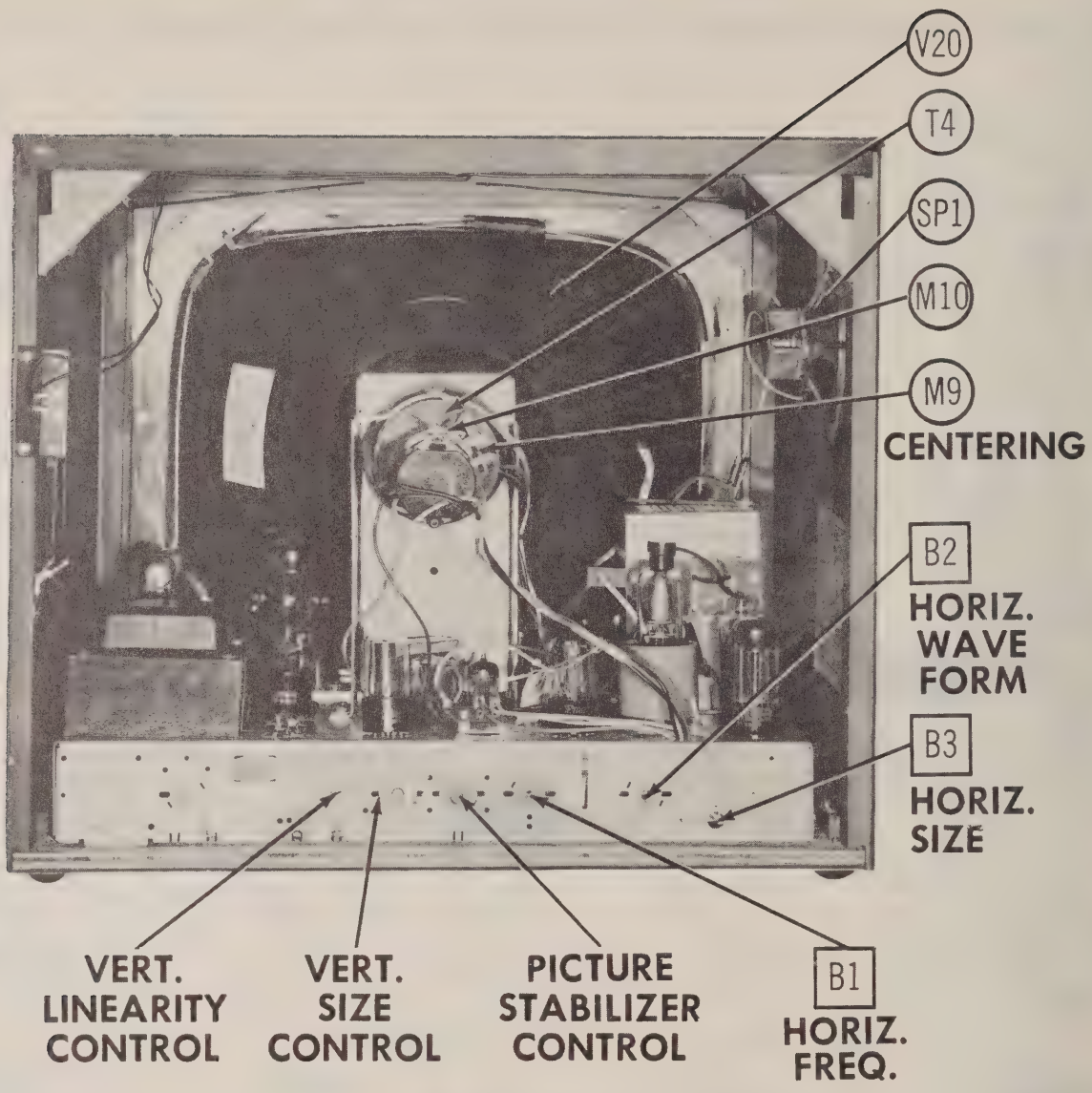
DIAL CORD STRINGING
CHASSIS 120238-H



DIAL CORD STRINGING CHASSIS
120238-F, 120249-D



UHF DIAL CORD DRIVE



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the picture stabilizer control (R7) fully clockwise .

Alignment of the horizontal oscillator can be done without removing chassis.

1. Turn the horizontal hold control maximum clockwise position.

2. Connect short across L20. Leads are brought to terminal strip on top of chassis (near the rear center) for shorting out L20.

3. Adjust the horizontal frequency slug (B1) to the center of the range over which the picture synchronizes horizontally.

4. Remove short from L20.

5. Connect the vertical input lead of an oscilloscope to point Ⓔ. Low side to chassis.

6. Adjust the horizontal waveform slug (B2) until the broad and narrow peaks are of equal amplitude as shown in Fig. 7.

7. Remove scope from point Ⓔ and chassis. The picture should be in sync and remain in synchronization over the entire range of the horizontal hold control.

Adjust the horizontal size slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

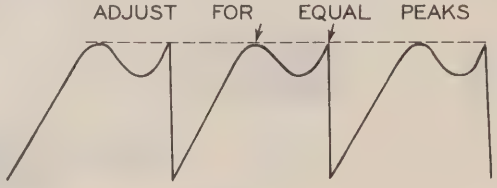
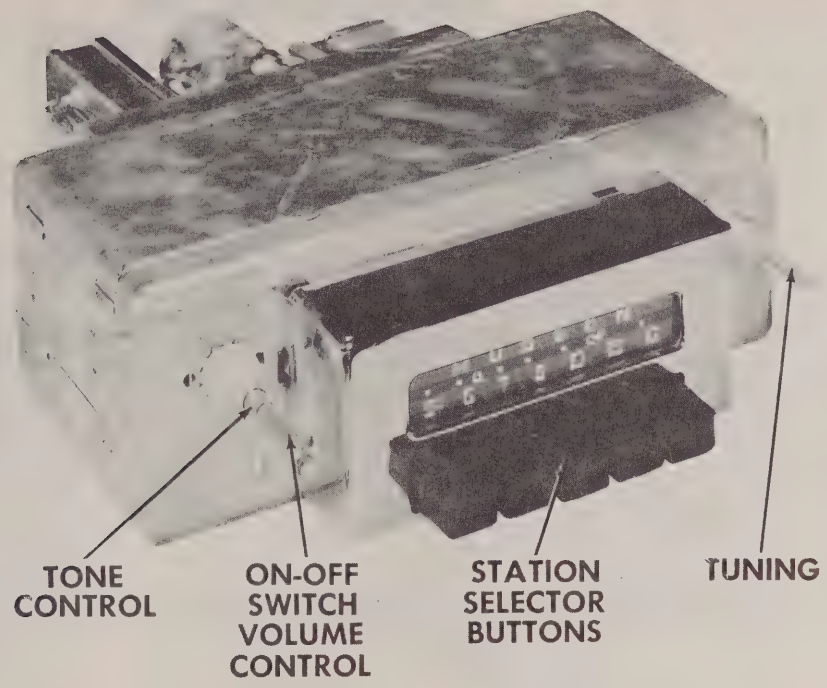


FIG. 7

HUDSON MODEL 4389027 (HN5AC-8)



HUDSON MODEL 4389027 (HN5AC-8)

TRADE NAME	Hudson Model 4389027 (Motorola Model HN5AC-8) (For 1955 Hudson Hornet & Wasp Cars)
MANUFACTURER	Motorola, Inc., 4545 Augusta Blvd., Chicago 51, Ill.
TYPE SET	Battery Operated Custom Built AM Superheterodyne Automobile Receiver
TUBES (Eight)	Types: 6BD6 RF Amp., 6BE6 Conv., 6BD6 IF Amp., 6AV6 Det.-AVC-AF Amp., 6AV6 Phase Inv., (2) 6AQ5 Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 8.0 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540-1605KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC	High freq. end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1	Thru dummy to antenna receptacle.	1605KC	"	"	*A5, A6, A7	"
3.	"	"	1300KC	Back off from high freq. end stop 21/64" .	"	A8, A9, A10	"
4.				Weak station around 1400KC		A7	With receiver installed in car and antenna fully extended, adjust A7 for maximum volume.

* Back tuner cores out until they have no effect on trimmer adjustment.

PUSH BUTTON ADJUSTMENT

Carefully tune to desired station manually, pull out first push button and push in firmly. Repeat on remaining buttons.

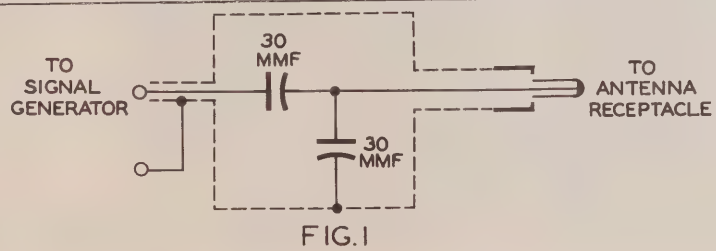


FIG. 1

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	6BD6	6BD6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amp.	6BD6	6BD6	7BK	
V4	Det-AVC-AF Amp.	6AV6	6AV6	7BT	
V5	Phase Inv.	6AV6	6AV6	7BT	
V6	Audio Output	6AQ5	6AQ5	7BZ	
V7	Audio Output	6AQ5	6AQ5	7BZ	
V8	Rect.	6X4	6X4	5BS	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	MOTOROLA PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	■20	350	23A532094	FP330	TM-3029	T-470	
B	▲20	350					
C	20	25					

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	MOTOROLA PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	
C2	90	500	21A591682				
C3	.006	400	8R121001		GP2-333-602	PT626	
C4	470	500	21R6673				
C5	4.7		21R115955	TCZ-4R7	NPOA-4R7	ZT-5547	
C6	47		21R114207	TCN-47	N750K-470	NT-5447	
C7	220		21R115986				
C8	.05	400	8R121567	DF-503		PT415	
C9	.05	400	8R121567	DF-503		PT415	
C10	.01	400	8R121002	D6-103	GP3-333-103	PT411	
C11	.02	400	8R121566	DF-203	817-02	PT412	
C12	.0015	600	8K121844	D6-152	GP2L-152		
C13	.02	400	8R121566	DF-203	817-02	PT412	
C14	220		21R410115	DD-221	811-221	UC-5322	
C15	.02	400	8R121566	DF-203	817-02	PT412	
C16	220		21R410115	DD-221	811-221	UC-5322	
C17	.02	1000	8R121004			PT1612	
C18	.5	100	8K122076			RF-480	
C19	.5	100	8K122076			RF-480	

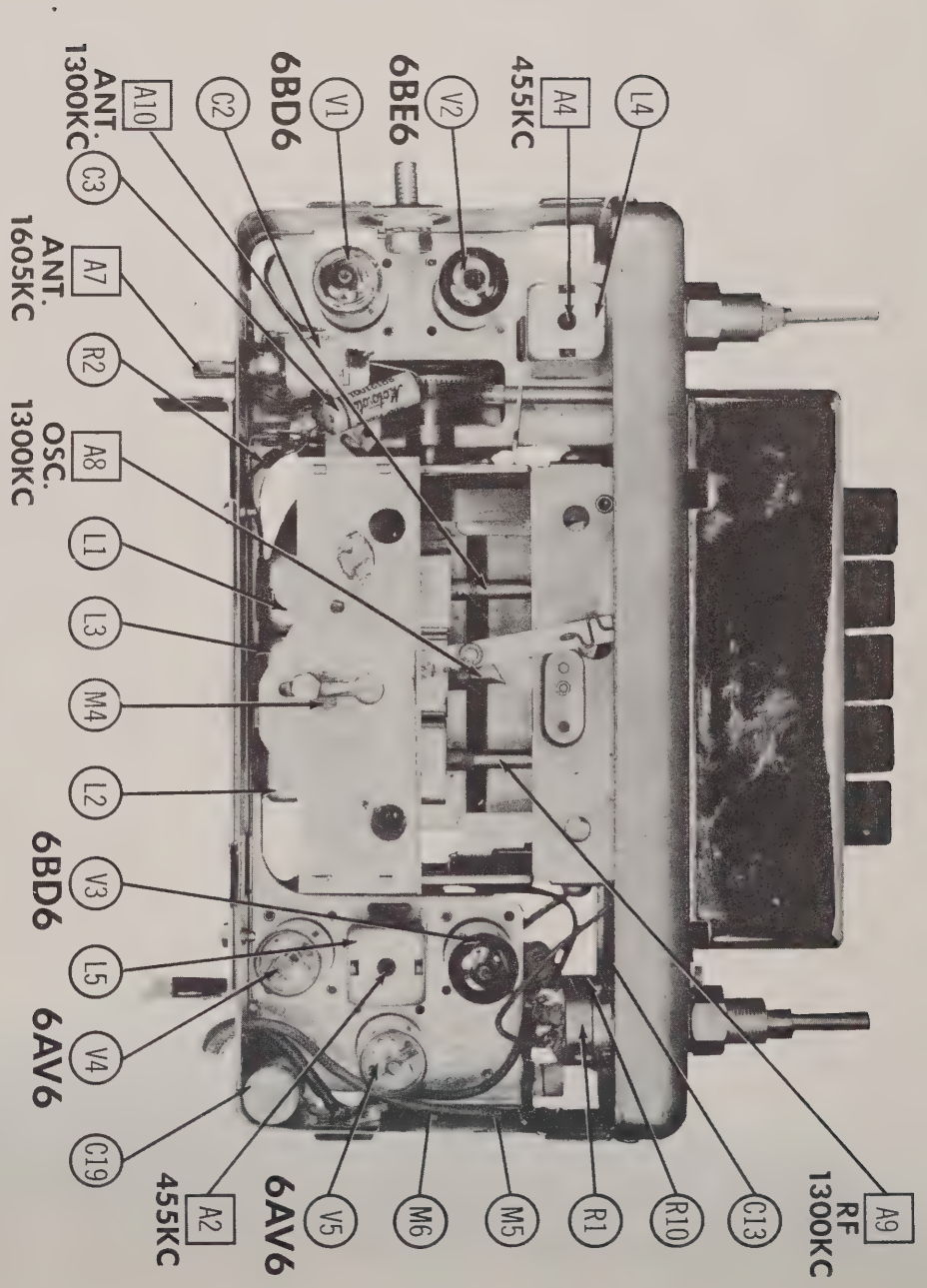
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	18B535175	F1-55	RTV-547C	QJ-866A †	UF16L ♦	Tone (Panel)
B	250KΩ	½		R4-37			UR254-T753	Volume (Tap at 75KΩ) (Rear)
C	Switch	½		KB-4			US-26	Attach to R1B.

♦ Universal Replacement (Mallory Exact Duplicate Part No. UE1652S)

† CONCENTRIKIT EQUIVALENT; K-6 KIT, BASE ELEMENTS AND SHAFTS; B11-137, P13-104 (Panel)
B18-130X, R16-127 (Rear)
76-1 (Switch)

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R2	470KΩ	1/2	6R6032	BTS-470K	
R3	12KΩ	1/2	6R6394	BTS-12K	
R4	680Ω	1/2	6R6040	BTS-680	
R5	33KΩ	1/2	6R6012	BTS-33K	
R6	6800Ω	2	6R5690	BTB-6800	
R7	390Ω	1/2	6R5554	BTS-390	
R8	47KΩ	1/2	6R6056	BTS-47K	
R9	1Meg	1/2	6R6004	BTS-1Meg	
R10	18KΩ	1/2	6R5591	BTS-18K	
R11	4.7Meg	1/2	6R2122	BTS-4.7Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R12	1Meg	1/2	6R6004	BTS-1Meg	
R13	1Meg	1/2	6R6004	BTS-1Meg	
R14	2200Ω	1/2	6R6069	BTS-2200	
R15	330KΩ	1/2	6R6014	BTS-330K	
R16	12KΩ	1/2	6R6394	BTS-12K	
R17	330KΩ	1/2	6R6014	BTS-330K	
R18	270Ω	1	6R6336	BTA-270	
R19	2200Ω	1	6A533220	BTA-2200	
R20	68Ω	1/2	6R6007	BTS-68	
R21	68Ω	1/2	6R6007	BTS-68	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	6.3VCT @ 4.5A	550VCT .070ADC			25C532631					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6KΩCT	1.6Ω	25B533038						

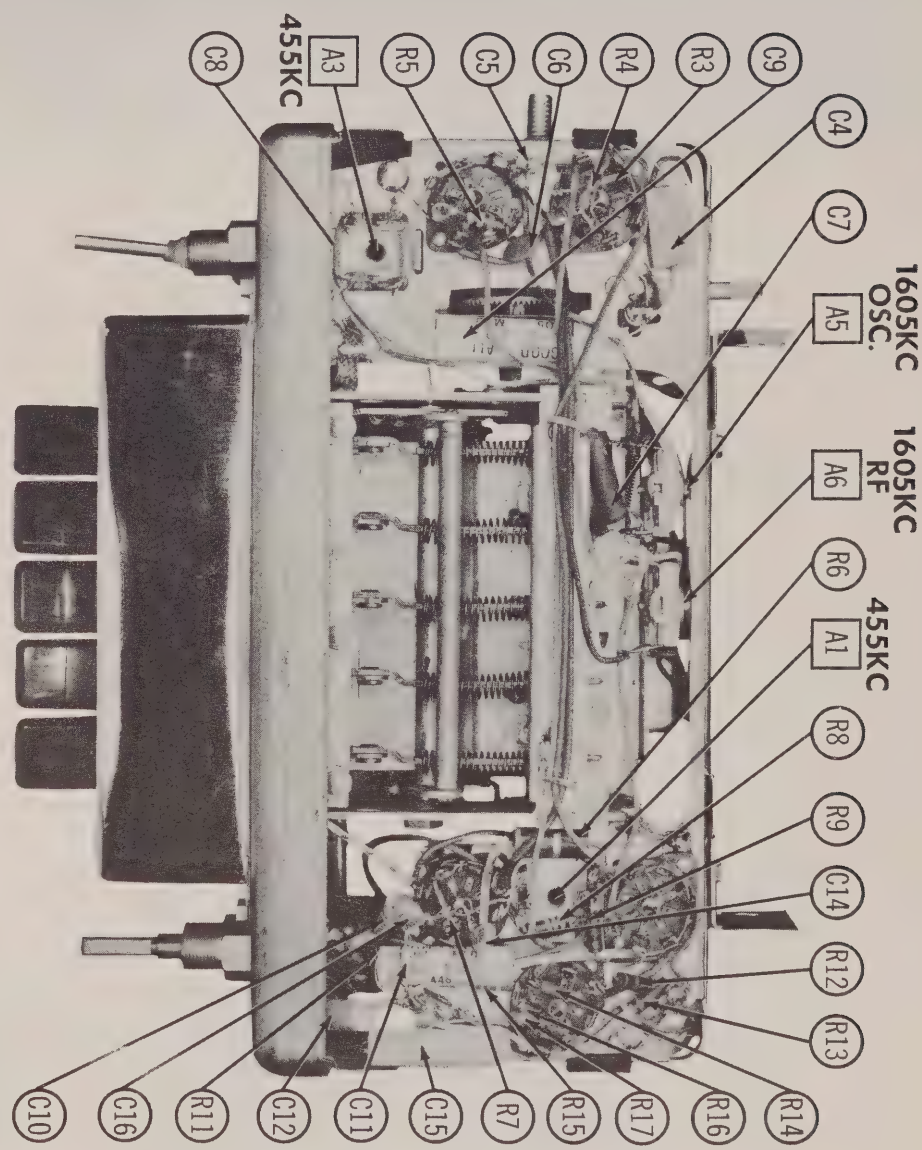
SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	5"x 7"	PM	3.2Ω	50C535573	57A21	
SP2	5"x 7"	PM	3.2Ω	50C535573	57A21	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	11Ω		24B520694				Core Part No. 46K489214
L2	RF Coil	11Ω		24K520695				Core Part No. 46K489214
L3	Osc. Coil	.9Ω	4.4Ω	24B520693				Core Part No. 46K489214
L4	Input IF	17Ω	17Ω	24C485553	16-6758	BC-352	12-C1	
L5	Output IF	18Ω	18Ω	24K485555	16-6770	BC-355	12-C6	
L6	Vib. Hash Choke	0Ω		24A532093				

CHASSIS—BOTTOM VIEW



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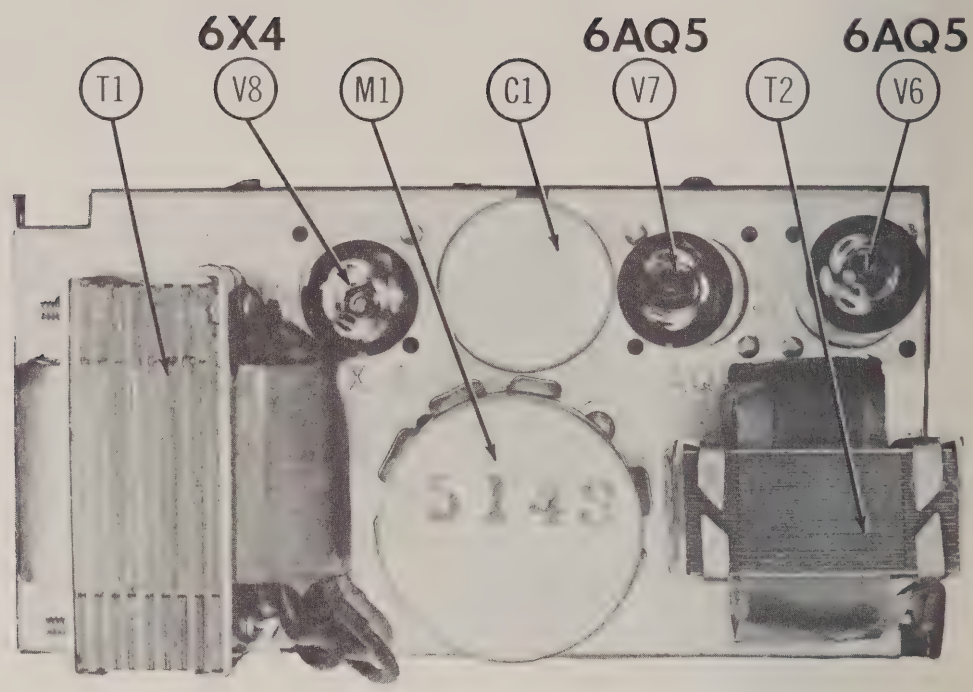

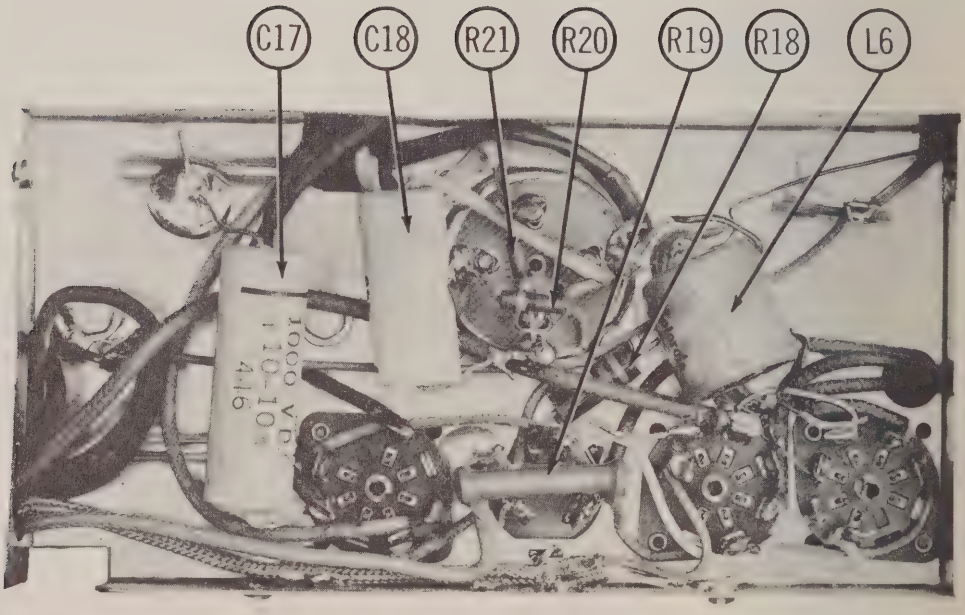

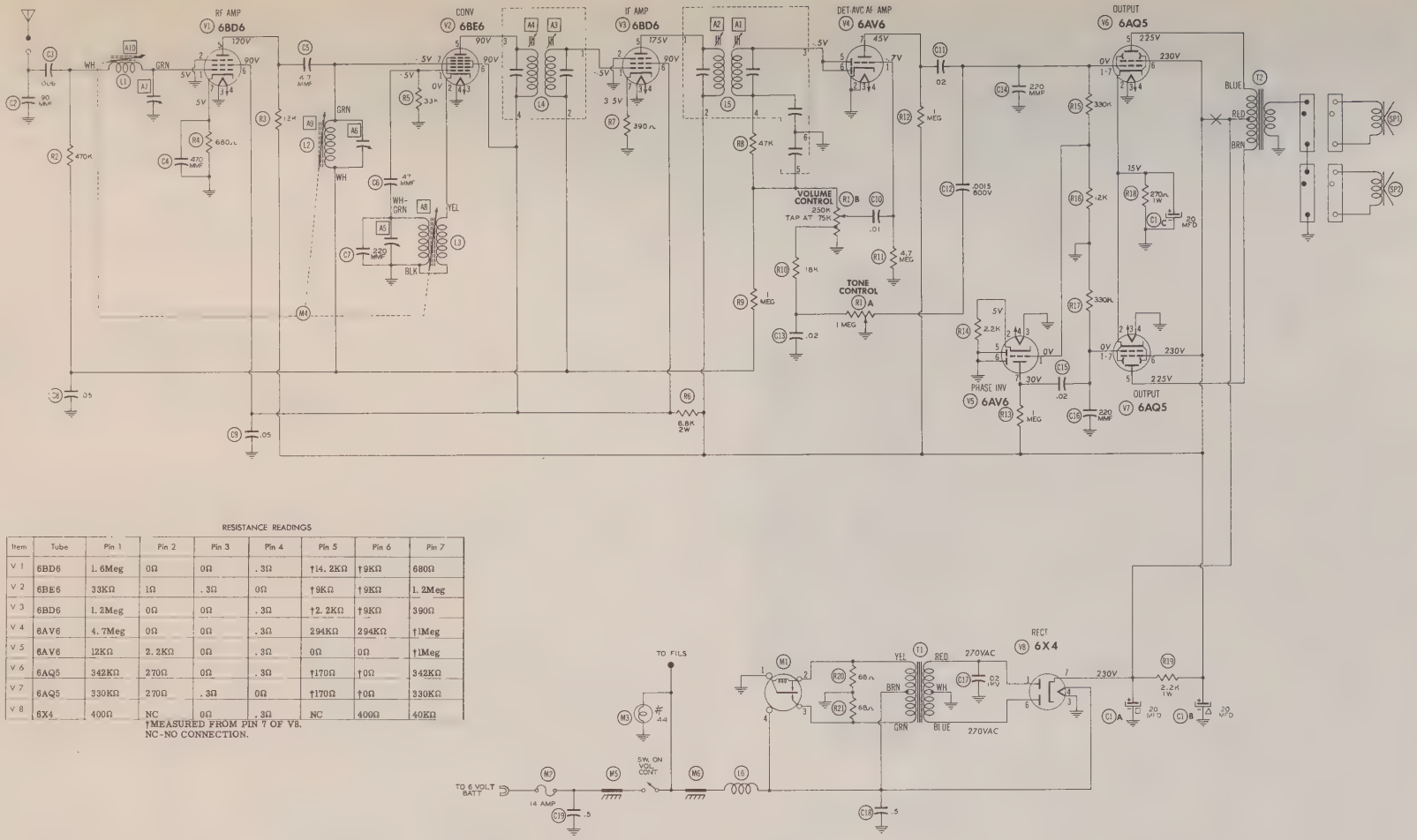

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BD6	1.6Meg	0Ω	0Ω	.3Ω	†14.2KΩ	†9KΩ	680Ω
V 2	6BE6	33KΩ	1Ω	.3Ω	0Ω	†9KΩ	†9KΩ	1.2Meg
V 3	6BD6	1.2Meg	0Ω	0Ω	.3Ω	†2.2KΩ	†9KΩ	390Ω
V 4	6AV6	4.7Meg	0Ω	0Ω	.3Ω	294KΩ	294KΩ	†1Meg
V 5	6AV6	12KΩ	2.2KΩ	0Ω	.3Ω	0Ω	0Ω	†1Meg
V 6	6AQ5	342KΩ	270Ω	0Ω	.3Ω	†170Ω	†0Ω	342KΩ
V 7	6AQ5	330KΩ	270Ω	.3Ω	0Ω	†170Ω	†0Ω	330KΩ
V 8	6X4	400Ω	NC	0Ω	.3Ω	NC	400Ω	40KΩ

†MEASURED FROM PIN 7 OF V8.
NC-NO CONNECTION.

IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC voltage measurements taken with vacuum tube voltmeter.
AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measurements taken from socket pin to common negative.
4. Battery voltage maintained at 6.3 volts for voltage readings.
5. Nominal tolerance on components allows makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				MOTOROLA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interruptor	6. 3V	115∿	48B3333	5342	903M	5342	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A	65K12894	9K535171	307014. (SFE14A)	155014	SFE14	HRI

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Dial Light	65X10867	#44
M4	Tuner	51D512128	Complete-Permeability, Includes L1, L2, L3.
M5	Spark Plate	64K535152	"A" Lead
M6	Spark Plate	64K535152	Filament
A5	Trimmer Cap.	20A77537	Osc. (5-80MMF)
A6	Trimmer Cap.	20A77537	RF (5-80MMF)
A7	Trimmer Cap.	20B535708	Ant. (20-180MMF)
	Pushbutton	1V513034	5 used
	Pointer	1V530527	
	Dial Scale	34B535176	

PHOTOFACT* Folder

*TRADE MARK

MAGNAVOX CHASSIS CMUA440AA, CMUA441AA, CMUA442AA, CTA440AA, CTA441AA, CTA442AA

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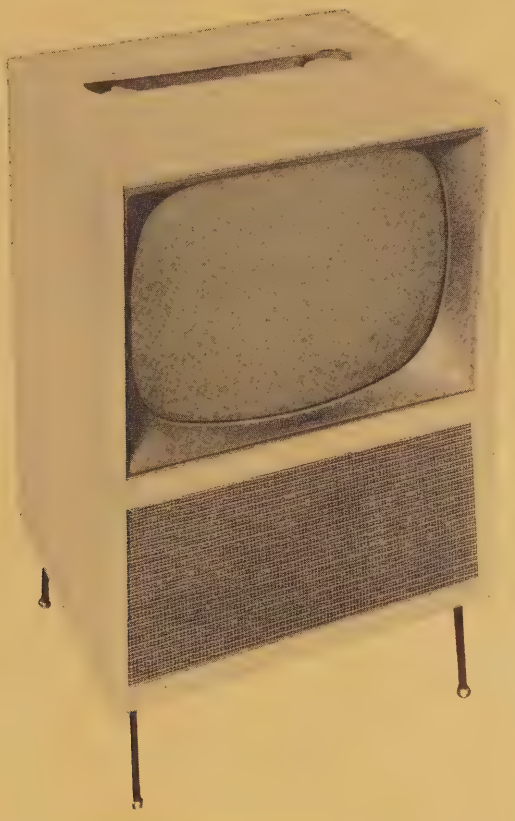

COLORADO
3924 MEADE ST.
OF

MAGNAVOX CHASSIS CMUA442AA

TRADE NAME	Magnavox Chassis CMUA440AA, CMUA441AA, CMUA442AA, CTA440AA, CTA441AA, CTA442AA
MANUFACTURER	Magnavox Co., 2131 Bueter Road, Fort Wayne 4, Indiana
TYPE SET	Television Receiver
TUBES	Twenty-one
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 1.68 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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MAGNAVOX CHASSIS CMUA440AA, CMUA441AA, CMUA442AA, CTA440AA, CTA441AA, CTA442AA

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PHOTOFACT* Folder
*TRADE MARK

MAGNAVOX CHASSIS CMUA440AA, CMUA441AA, CMUA442AA, CTA440AA, CTA441AA, CTA442AA

PROPERTY OF
DENVER, COLORADO

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 11 push-on type control knobs from top panel of cabinet.

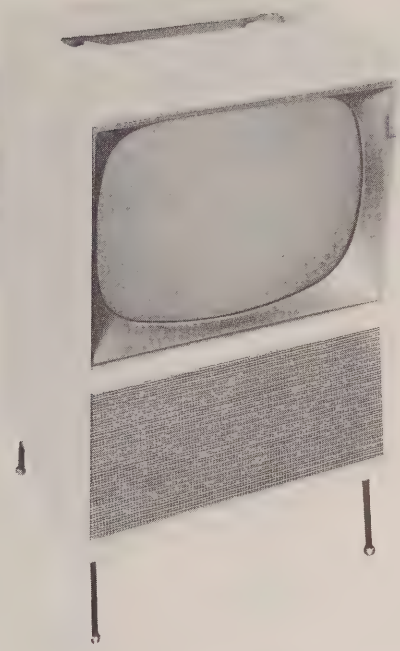
2. Remove 6 wood screws and 1 metal screw. Remove rear cover.

3. Disconnect speaker leads.

4. Remove 3 screws holding mounting board braces to sides of cabinet.

5. Remove 6 chassis mounting board bolts. (Note: Hold mounting board up when removing bolts). Let mounting board drop into guide and slide out.

6. Remove 8 speaker nuts. Remove 2 speakers.



CHASSIS
CMUA440AA, CMUA441AA, CMUA442AA,
CTA440AA, CTA441AA, CTA442AA

MAGNAVOX CHASSIS CMUA440AA, CMUA441AA, CMUA442AA, CTA440AA, CTA441AA, CTA442AA

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass, remove 4 wood screws holding metal strip at the top edge of safety glass. Remove metal strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator circuit it is necessary to remove the rear cover and supply power to the set. Set the horizontal hold control at its mid-range position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally .

SOUND IF DETECTOR ADJUSTMENT

To eliminate sound IF detector buzz, adjust the discriminator secondary slug (A11) located on top of chassis.

FUSES

One fuse is used for horizontal and vertical sweep circuit protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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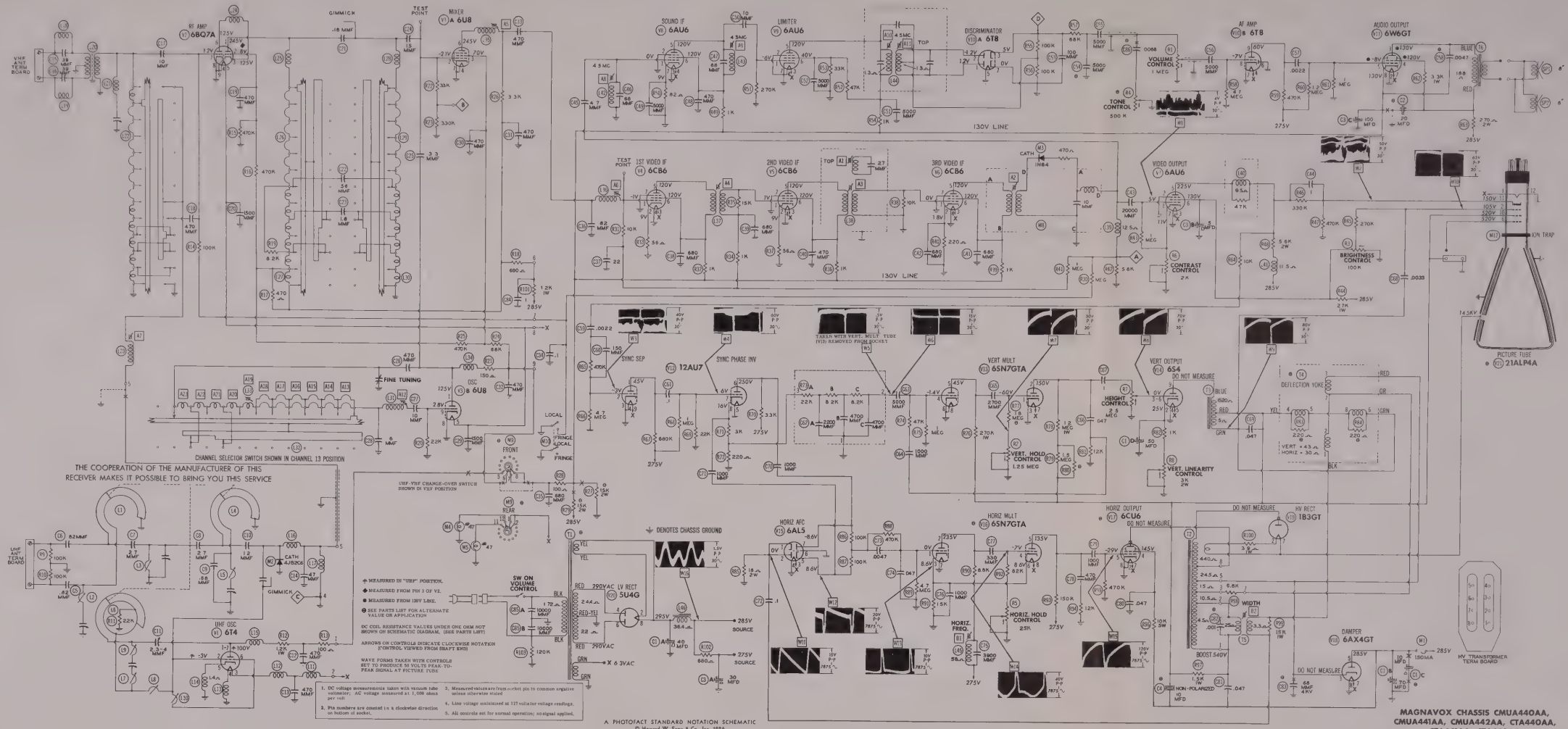
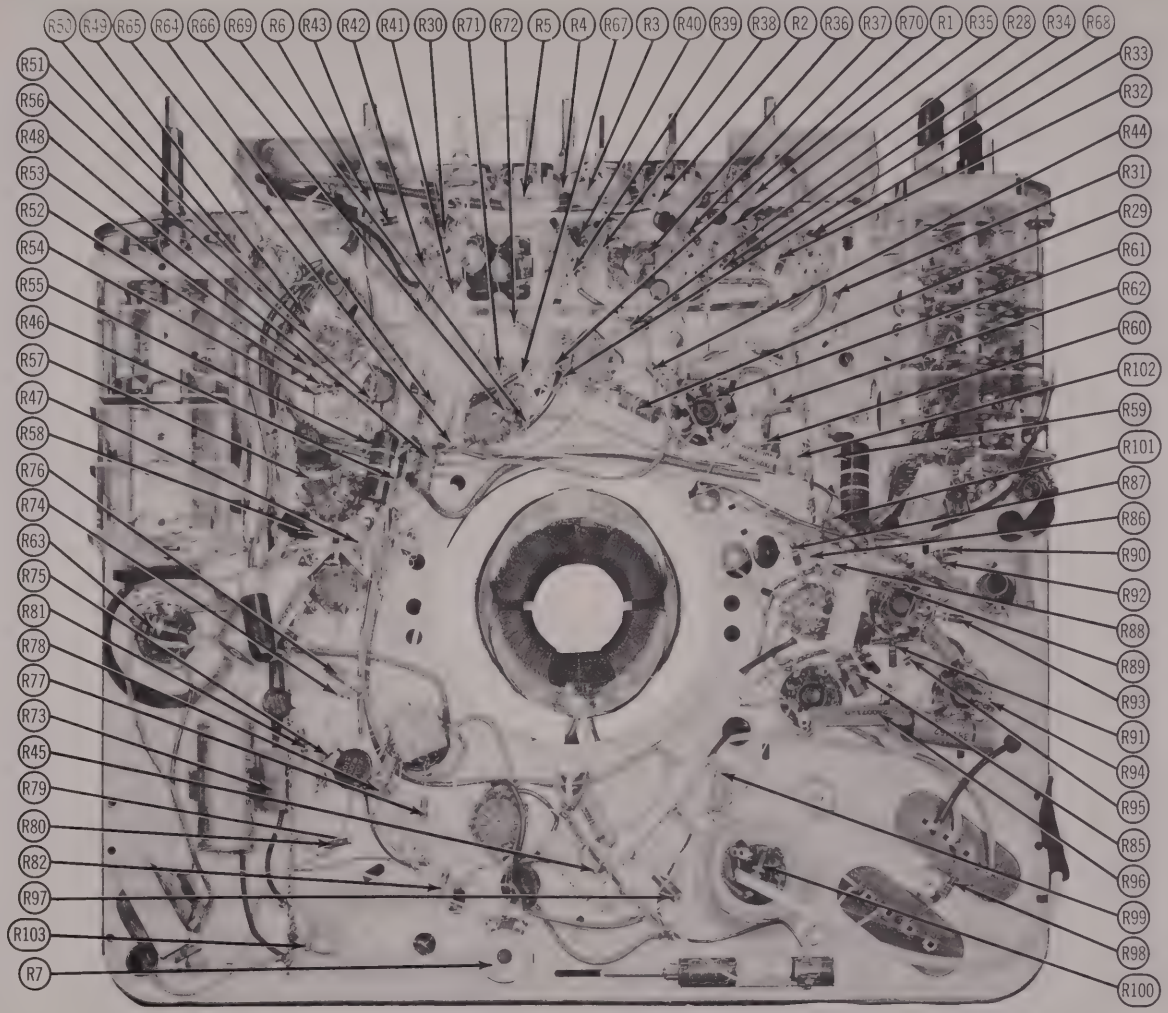

MAGNAVOX CHASSIS CMUA440AA, CMUA441AA, CMUA442AA, CTA440AA, CTA441AA, CTA442AA
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
UHF-VHF CHANGE-OVER SWITCH SHOWN IN VHF POSITION
DENOTES CHASSIS GROUND
SW ON VOLUME CONTROL
FINE TUNING
LOCAL
FRINGE
TEST POINT
GIMMICK
RF AMP V7 6BQ7A
MIXER V1 A 6U8
OSC V3 B 6U8
UHF OSC V1 6T4
SOUND IF V9 6AU6
LIMITER V10 6AU6
DISCRIMINATOR V10 A 6T8
AF AMP V10 B 6T8
AUDIO OUTPUT V11 6W6GT
1ST VIDEO IF V4 6CB6
2ND VIDEO IF V5 6CB6
3RD VIDEO IF V6 6CB6
VIDEO OUTPUT V7 6AU6
SYNC SEP V12 12AU7
SYNC PHASE INV
VERT MULT V13 6SN7GTA
VERT OUTPUT V16 6S4
HORIZ AFC V15 6AL5
HORIZ MULT V16 6SN7GTA
HORIZ OUTPUT V17 6CL6
HV RECT V19 1B3GT
DAMPER V18 6AX4GT
LV RECT V20 5U4G
130V LINE
275V
285V
VOLUME CONTROL 1 MEG
TONE CONTROL 500 K
CONTRAST CONTROL 2K
BRIGHTNESS CONTROL 100 K
HEIGHT CONTROL 2.5 MEG
VERT. HOLD CONTROL 1.25 MEG
VERT. LINEARITY CONTROL 3K 2W
HORIZ. HOLD CONTROL 25K
HORIZ. FREQ.
WIDTH
BOOST 540V
DO NOT MEASURE
ION TRAP
PICTURE TUBE V21 21ALP4A
14.5KV
DEFLECTION YOKE
HV TRANSFORMER TERM BOARD
UHF ANT TERM BOARD
VHF ANT TERM BOARD
TAKEN WITH VERT. MULT TUBE (V13) REMOVED FROM SOCKET
MEASURED IN "UHF" POSITION.
MEASURED FROM PIN 3 OF V2.
MEASURED FROM 130V LINE.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM. (SEE PARTS LIST)
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1,000 ohms per volt
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured voltages are from socket pin to common negative unless otherwise stated
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1956
MAGNAVOX CHASSIS CMUA440AA, CMUA441AA, CMUA442AA, CTA440AA, CTA441AA, CTA442AA

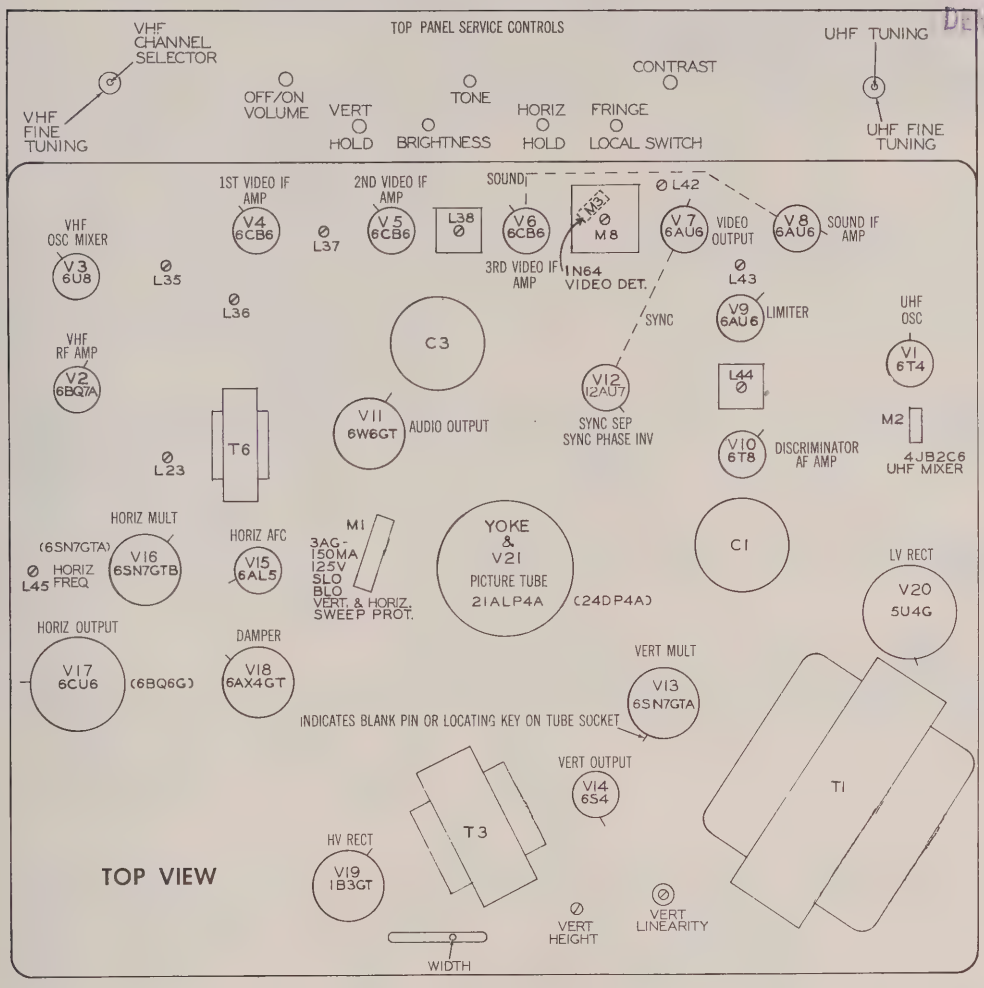
MAGNAVOX CHASSIS CMUA440AA, CMUA441AA, CMUA442AA, CTA440AA, CTA441AA, CTA442AA



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

TUBE PLACEMENT CHART

OF
L. I. SHANNENSHIP
3994 MEADE ST.
DENVER, COLORADO



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V20**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6, V11 (V1 UHF only)**
No pic, no sound, has snow - **V2, V3, V4**
No pic, has sound, has raster - **V7, V21**
Has pic, no sound - **V8, V9, V10, V11**

SYNC FAILURE
No vert. sync - **V12, V13**
No horiz. sync - **V12, V15, V16**
No vert. or horiz. sync - **V12**

SWEEP FAILURE
No raster, has sound - **V16, V17, V18, V19, V21, Fuse (M1)**
No vertical deflection - **V13, V14**
Poor vert. linearity or foldover - **V13, V14**
Poor horiz. linearity or foldover - **V16, V17, V18**
Narrow picture - **V16, V17, V18, V19, V20**
Vert. off freq. - **V12, V13**
Horiz. off freq. - **V12, V15, V16**

MAGNAVOX CHASSIS CMUA440AA, CMUA441AA, CMUA442AA, CTA440AA, CTA441AA, CTA442AA

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Do not remove the horizontal multivibrator tube (V16) to disable the high voltage. The high voltage lead should be securely taped and kept away from chassis.

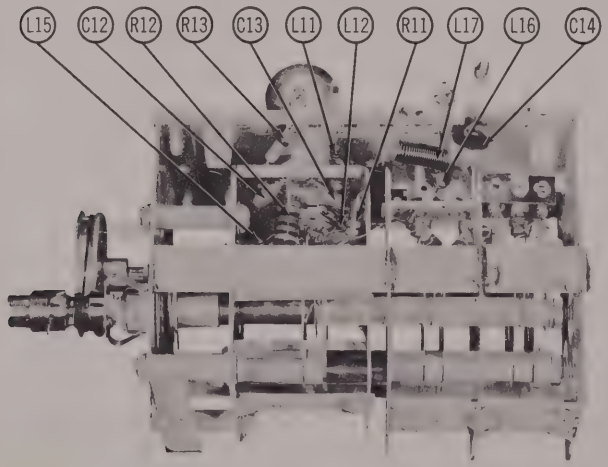
VIDEO IF ALIGNMENT

Connect the negative lead of a 1. 5 volt battery to the ungrounded side of C34. Connect the negative lead of a -3 volt to the ungrounded side of C37.
Connect both positive leads to chassis. Set the contrast control fully counter clockwise.
Fringe-local switch to local position.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 (grid) of 6CB6 (V4). Low side to chassis.	43MC (10MC Swp)	47.25MC	Any non-interfering channel	Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis.	A1	A second signal generator to be used for markers should be coupled to point Ⓑ and chassis. Use enough sweep generator output so that trap notch is plainly visible on scope. Adjust A1 to place 47.25MC marker in trap notch as in Fig. 1. It is possible to obtain two settings of A1. The correct setting is with A1 furthest out of coil form.
2.	"	"	"	43.75MC 45.75MC	"	"	A2	Adjust for maximum response between 43.75MC and 45.75MC markers (Fig.2).
3.	"	"	"	45.75MC	"	"	A3	Adjust to place 45.75MC marker at 60% on response curve. (Fig. 2).
4.	"	"	"	42.75MC	"	"	A4	Adjust to place 42.75MC marker at 60% on low frequency side of response curve. Repeat steps 2, 3 and 4 until response is similar to Fig. 2. Recheck A1 trap (47.25 MC) setting.
5.	1KΩ Resistor	High side to point Ⓒ. Low side to chassis.	"	45.75MC	Any unused channel between 7 and 13	"	A5, A6	Connect high side of marker generator to tuner chassis. (Leave low side disconnected) Adjust A5 for maximum gain while placing 45.75MC marker at 50% on response curve as in Fig. 2. Adjust A6 for maximum gain and overall response with proper tilt. It may be necessary to alternately adjust A5 and A6 several times to obtain response within limits as shown in Fig. 2.
6.	"	High side to point Ⓒ thru 1KΩ. Low side to chassis.	43MC (10MC Swp)	43.75MC 45.0MC 45.75MC	Any unused UHF channel	Vert. Amp. thru 10KΩ to point A. Low side to chassis.	A7	Set VHF tuner to UHF position. Adjust A7 for MINIMUM tilt on response curve as in Fig. 2. This adjustment need be made only when UHF/VHF tuner is used in set.

SOUND IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.003MFD	High side to point Ⓐ. Low side to chassis.	4.5MC (Usmod)	Any non-interfering channel	DC probe to point Ⓓ. Common to chassis.	A8, A9, A10	Attenuate generator output to maintain 6.5 to 7 volts for accuracy. Adjust for maximum deflection.
8.	"	"	"	"	"	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.



UHF TUNER RIGHT SIDE

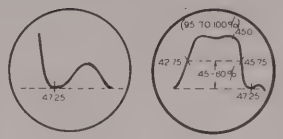


FIG.1

FIG.2

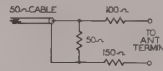


FIG. 3

OSCILLATOR ALIGNMENT

Loosely couple an RF generator to the grid of the 1st Video IF amplifier (V4) and tune it accurately to 45. 75MC.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

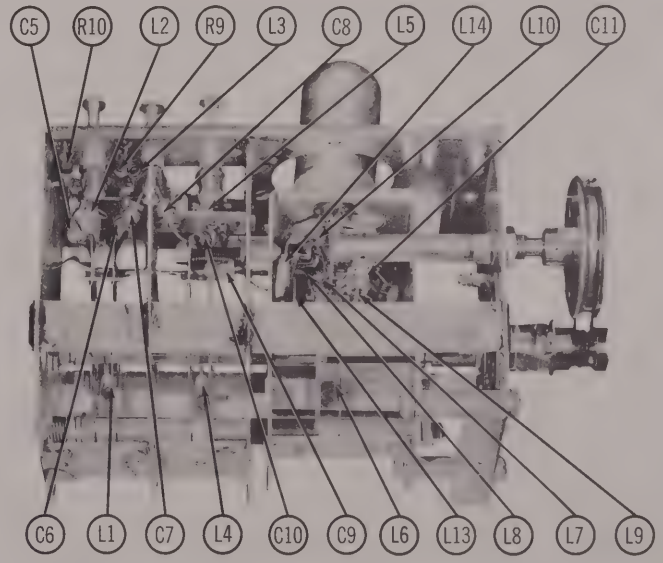
	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9	Fig.3	Thru matching network (Fig. 3) to antenna terminals.	213MC (10MC Swp)	211.25MC 45.75MC	13	Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis.	A12	Adjust to make markers coincide on response curve.
10.	"	"	207MC (10MC Swp)	205.25MC 45.75MC	13	"	A13	Adjust (compress or expand coil) to make markers coincide on response curve.
			201MC (10MC Swp)	199.25MC 45.75MC	11		A14	
			195MC (10MC Swp)	193.25MC 45.75MC	10		A15	
			189MC (10MC Swp)	187.25MC 45.75MC	9		A16	
			183MC (10MC Swp)	181.25MC 45.75MC	8		A17	
			177MC (10MC Swp)	175.25MC 45.75MC	7		A18	
11.	"	"	85MC (10MC Swp)	83.25MC 45.75MC	6	"	A19	Adjust to make markers coincide on response curve.
12.	"	"	79MC (10MC Swp)	77.25MC 45.75MC	5	"	A20	Adjust (compress or expand coil) to make markers coincide on response curve.
			69MC (10MC Swp)	67.25MC 45.75MC	4		A21	
			63MC (10MC Swp)	61.25MC 45.75MC	3		A22	
			57MC (10MC Swp)	55.25MC 45.75MC	2		A23	

RF AND MIXER ALIGNMENT

The RF and Mixer portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion is not recommended in the field.

UHF TUNER ALIGNMENT

The UHF Tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.



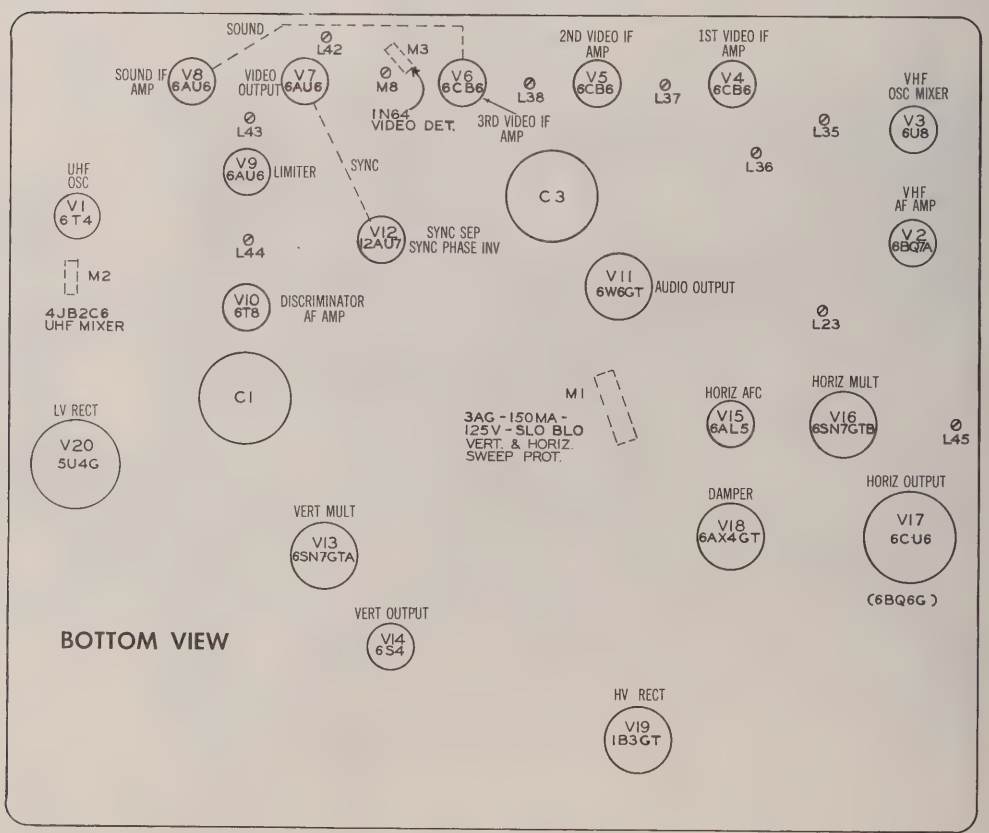
UHF TUNER LEFT SIDE

MAGNAVOX CHASSIS CMUA440AA, CMUA441AA, CMUA442AA, CTA440AA, CTA441AA, CTA442AA

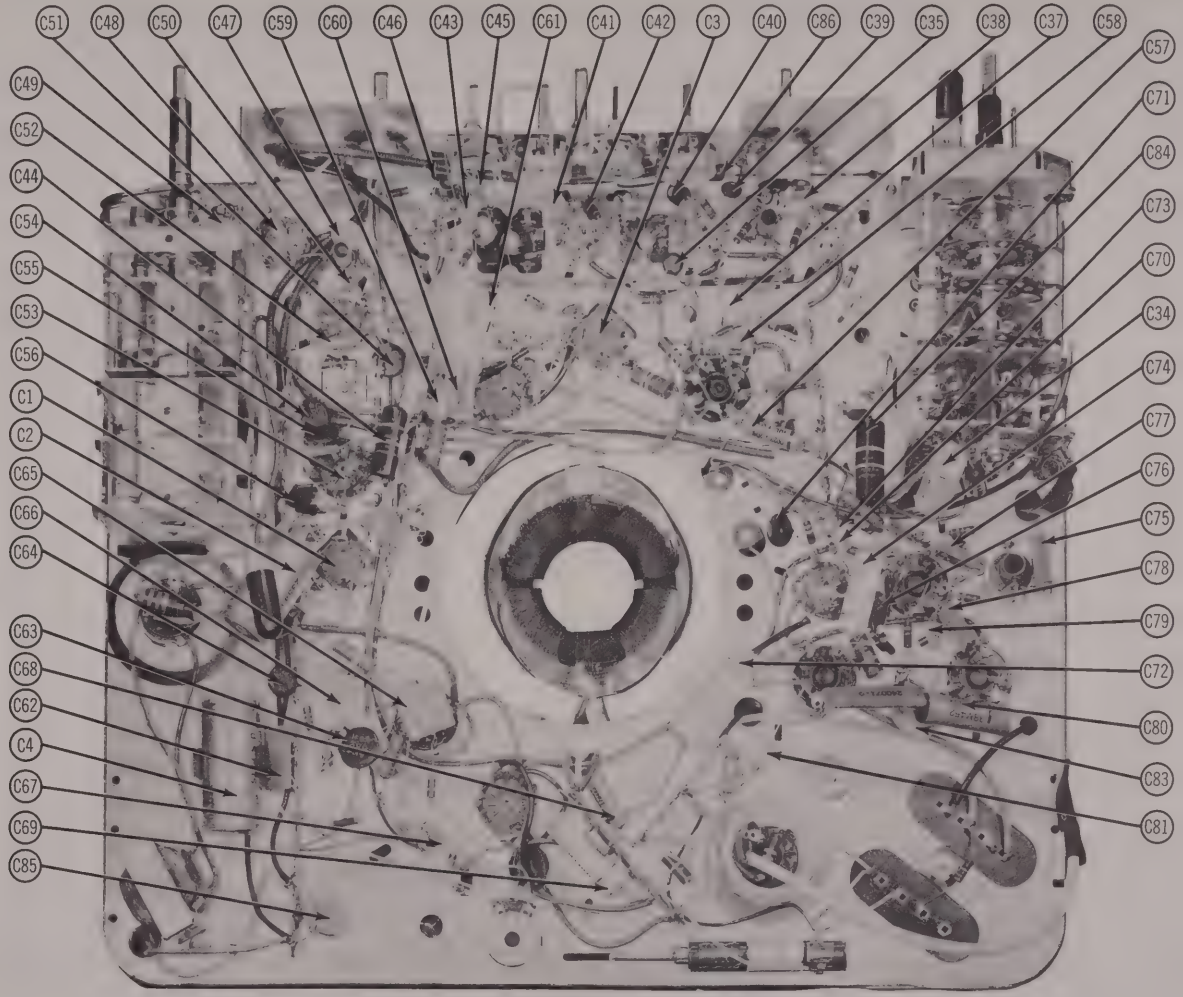
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6T4	*■1. 4KΩ	22KΩ	. 1Ω	0Ω	1. 4Ω	22KΩ	*■1. 4KΩ		
V 2	6BQ7A	†1. 9KΩ	250KΩ	INF	0Ω	. 1Ω	INF	1. 1Meg	0Ω	0Ω
V 3	6U8	■250Ω	363KΩ	■68KΩ	0Ω	. 1Ω	†5. 5KΩ	0Ω	0Ω	22KΩ
V 4	6CB6	1Meg	56Ω	. 1Ω	0Ω	■1KΩ	■1KΩ	0Ω		
V 5	6CB6	1Meg	56Ω	. 1Ω	0Ω	■1KΩ	■1KΩ	0Ω		
V 6	6CB6	. 1Ω	220Ω	. 1Ω	0Ω	■1KΩ	■1KΩ	0Ω		
V 7	6AU6	1Meg	0Ω	. 1Ω	0Ω	†5. 6KΩ	†27KΩ	90Ω		
V 8	6AU6	. 5Ω	0Ω	0Ω	. 1Ω	■1KΩ	■1KΩ	82Ω		
V 9	6AU6	270KΩ	0Ω	. 1Ω	0Ω	■1KΩ	■25KΩ	0Ω		
V 10	6T8	100KΩ	100KΩ	200KΩ	. 1Ω	0Ω	0Ω	0Ω	4. 7Meg	†470KΩ
V 11	6W6GT	NC	0Ω	†500Ω	†3. 6KΩ	600KΩ	TP	. 1Ω	11KΩ	
V 12	12AU7	†680KΩ	4. 7Meg	0Ω	0Ω	0Ω	†4KΩ	22KΩ	3. 2KΩ	. 1Ω
V 13	6SN7GTA	2. 2Meg	▲1. 7Meg	0Ω	1Meg	▲270KΩ	0Ω	. 1Ω	0Ω	
V 14	6S4	NC	2. 1KΩ	1. 2Meg	0Ω	. 1Ω	1. 2Meg	NC	NC	▲3KΩ
V 15	6AL5	18Ω	18Ω	. 1Ω	0Ω	5Meg	0Ω	5Meg		
V 16	6SN7GTB	4. 7Meg	†7. 5KΩ	1. 5KΩ	90KΩ	†150KΩ	1. 5KΩ	0Ω	. 1Ω	
V 17	6CU6	NC	0Ω	NC	†10KΩ	470KΩ	TP	. 1Ω	0Ω	TOP CAP ▲24. 5Ω
V 18	6AX4GT	NC	NC	INF	NC	†60Ω	NC	. 1Ω	0Ω	
V 19	1B3GT		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▲465Ω
V 20	5U4G	NC	20KΩ	TP	24Ω	NC	22Ω	TP	20KΩ	
V 21	21ALP4A	. 1Ω	†320KΩ	PIN 6 ▲1. 5KΩ	PIN 10 ▲1. 5KΩ	PIN 11 †200KΩ	PIN 12 0Ω			

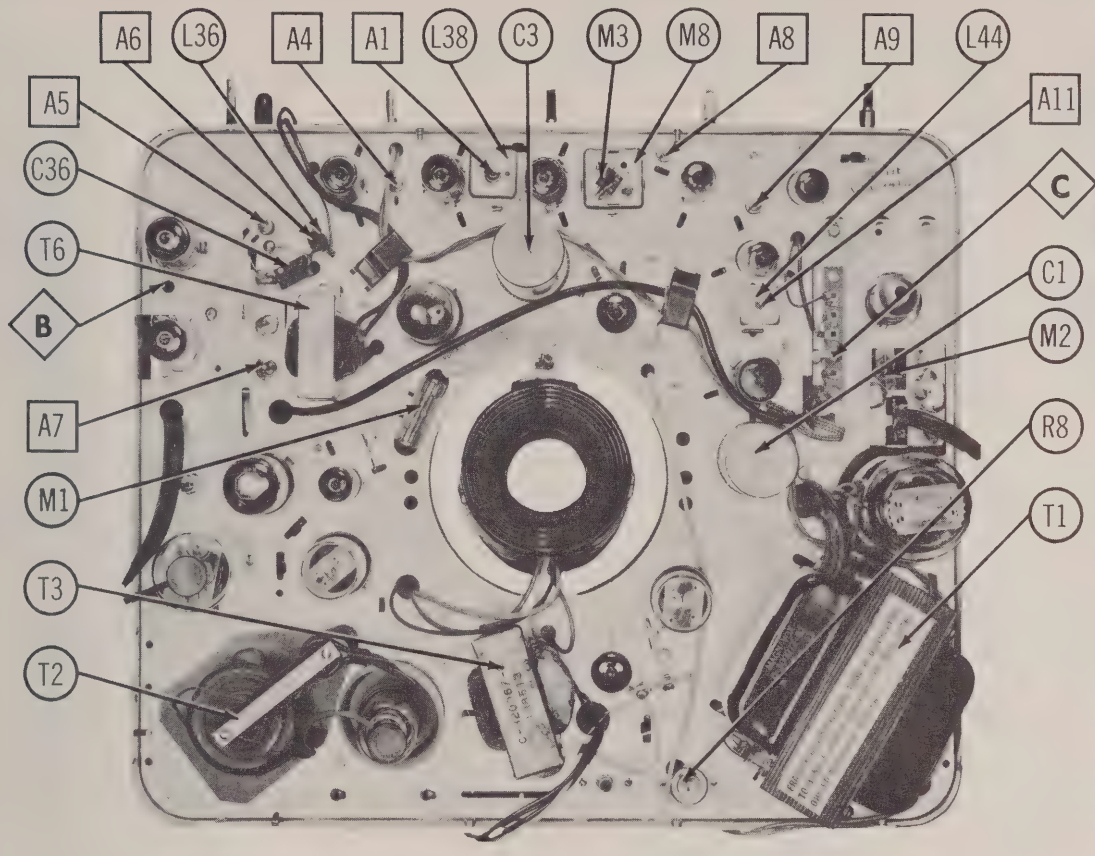
*MEASURED IN "UHF" POSITION.
■MEASURED FROM 130V LINE.
†MEASURED FROM PIN 8 OF V20.
▲MEASURED FROM PIN 3 OF V18.
TP-TIE POINT.
NC-NO CONNECTION.



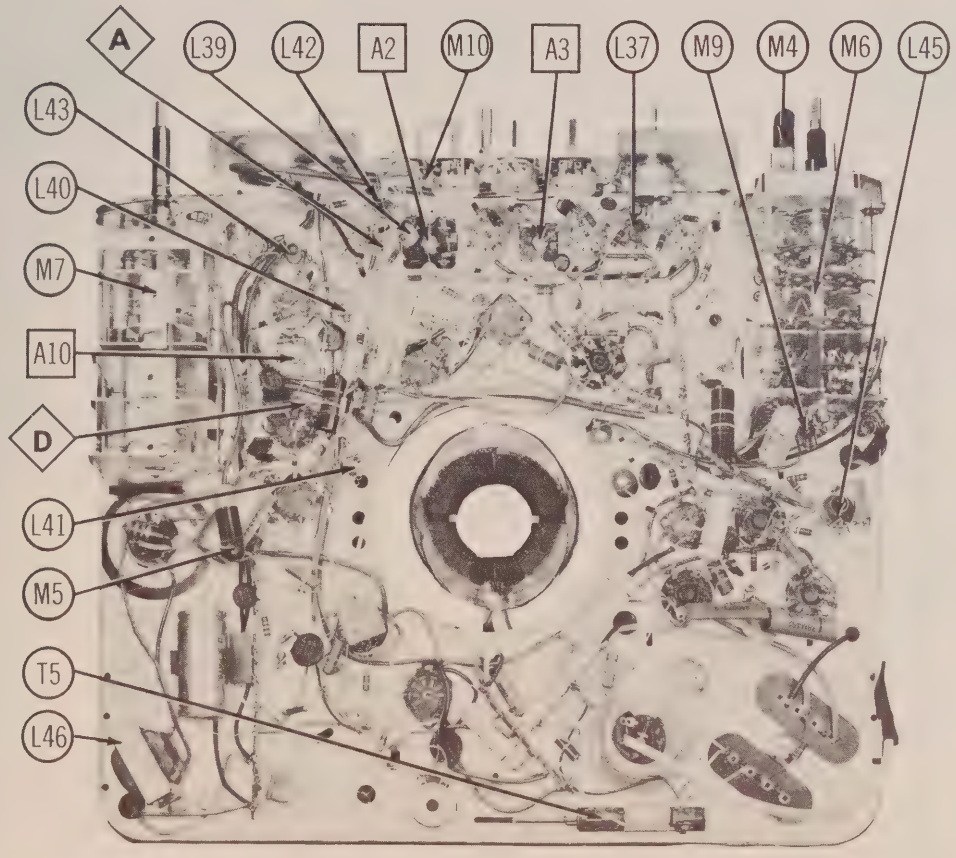
TUBE PLACEMENT CHART



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No	USE	REPLACEMENT DATA: MAGNAVOX PART No	STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	UHF Osc.	5T4	5T4	7DK	
V2	RF Amp.	6BQ7A	6BQ7A	9AJ	
V3	Mixer Osc.	6U8	6U8	9AE	
V4	1st Video IF Amp.	6CB6	6CB6	7CM	
V5	2 nd Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Output	6AU6	6AU6	7BK	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Limiter	6AU6	6AU6	7BK	
V10	Discriminator				
	AF Amp.	6T8	6T8	9E	
V11	Audio Output	6W6GT	6W6GT	7AC	
V12	Sync Sep. - Sync Phase Inv.	12AU7	12AU7	9A	
V13	Vert. Mult.	6SN7GTA	6SN7GTA	9BD	
V14	Vert. Output	6S4	6S4	9AC	
V15	Horiz. AFC	6AL5	6AL5	6BT	
V16	Horiz. Mult.	6SN7GTB	6SN7GTB	9BD	6SN7GTA used as an alternate.
V17	Horiz. Output	6CU6	6CU6	6AM	6BQ6G used as an alternate.
V18	Damper	6AX4GT	6CG	5CM	
V19	HV Rect.	1B3GT	1B3GT	3C	
V20	LV Rect.	5U4G	5U4G	5Z	

CATHODE-RAY TUBE

ITEM No	MAGNAVOX PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V21	21ALP4A ①	21ALP4A ①	21ALP4A ①	21ALP4A ②	21ALP4A ①	12L	① Aluminized ② Silver Screen
	21ALP4	21ALP4		21ALP4	21ALP4	12L	
	24DP4A ①	24DP4A ①	24DP4A ①	24DP4A ②	24DP4A ①	12L	
				24DP4	24DP4	12L	

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP	VOLT	MAGNAVOX PART No	MALLORY PART No	PYRAMID PART No	SANGAMO PART No	NOTES
C1A	⌀40	350	270021-52	FP431.3	TM-4084	Q-025	
B	⌀70	250		TC77	TD-40-350	MT-0580	
C	⌀ 30	350					Note 1
D	50	50					
C2	20	350	270027-30	TC65	TD-20-350	FM-6530	Note 1
C3A	⌀30	350	270021-56		TM-3020-	Q-007	
B	⌀5	350			350		
C	100	200			TD-00-200	MT-4520	
C4	10	350	270027-36		TD-10-350-XP	MT-4520	Note 2

Note 1. When C1C is used, C2 is omitted.
Note 2. Non-polarized unit.
• Connect negative leads together.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.

ITEM No	RATING: CAP	VOLT	MAGNAVOX PART No	CENTRALAB PART No	ERIE PART No	MALLORY PART No	NOTES
C5	.82		250721-113				
C6	.82		250721-113				
C7	2.7		250721-119				
C8	2.7		250721-119				
C9	.68		250721-122	TCZ-R68	NP0A-0R68		
C10	1.3		250721-115				
C11	2.5-4		250720-2				
C12	470		250175-8	DD-471	SI-471	UC-5347	
C13	470		250175-8	DD-471	SI-471	UC-5347	
C14	47		250175-21	TCN-47	N750K-470		
C15	39		250175-20	TCN-39	N750K-390		
C16	39		250175-20	TCN-39	N750K-390		
C17	10		250721-127	TCZ-10	NP0A-100	ZT-541	
C18	470		250175-8	DD-471	SI-471	UC-5347	
C19	470		250175-8	DD-471	SI-471	UC-5347	
C20	1500		250175-10	DD-152	SG1-0015	DC-5215	
C21	.18		250216-4				
C22	.56		250221-111				
C23	1.8		250221-117				
C24	15		250207-5	D6-150	NP0K-150		
C25	3.3		250221-121	TCZ-3R3	NP0A-3R3	ZT-5533	
C26	470		250175-8	DD-471	SI-471	UC-5347	
C27	10		250088-136	TCN-10	N750A-100	NT-541	
C28	6		250088-137				
C29	1500		250175-10	DD-152	SG1-0015	DC-5215	
C30	470		250175-8	DD-471	SI-471	UC-5347	
C31	470		250175-8	DD-471	SI-471	UC-5347	
C32	470		250175-8	DD-471	SI-471	UC-5347	
C33	470		250175-8	DD-471	SI-471	UC-5347	
C34	.1	200	250202-13	DF-104		PT401	
C35	680		250218-4	DD-681	SI-681	UC-5368	
C36	03	500	250159-3045	TCZ-S3	NP0-337-S20		
C37	.22	200	250202-15			PT4023	
C38	680		250218-10	DD-681	SI-681		
C39	680		250218-4	DD-681	SI-681	UC-5368	
C40	470		250218-15	DD-471	SI-471	UC-5347	
C41	680		250218-4	DD-681	SI-681	UC-5368	
C42	680		250218-4	DD-681	SI-681	UC-5368	
C43	30000		250175-7	DD-203	SI7-03		
C44	.1	200	250202-13	DF-104		PT401	
C45	4.7		250221-123	TCZ-4R7	NP0A-4R7	ZT-5547	
C46	68		250218-7	DD-680	SD1-680	UC-5488	
C47	68		250218-7	DD-680	SD1-680	UC-5488	
C48	470		250218-8	DD-471	SI-471	UC-5347	
C49	5000		250175-1	DD-502	SL1-005	DC-525	
C50	10		250207-3	D6-100	NP0A-100	ZT-541	
C51	5000		250175-1	DD-502	SL1-005	DC-525	
C52	5000		250175-1	DD-502	SL1-005	DC-525	
C53	100		250207-46	D6-101	GP1K-101	UC-531	
C54	5000		250175-1	DD-502	SL1-005	DC-525	Note 3
C55	5000		250175-1	DD-502	SL1-005	DC-525	
C56	5000		250175-1	DD-502	SL1-005	DC-525	
C57	.0082	400	250212-3	D6-222	GP2-333-222	PT6322	
C58	.0047	600	250230-5	D6-472	GP3-333-472	PT6347	Note 4
C59	.0033	400	250212-5	D6-332	GP2-333-332	PT6332	
C60	150	500	250159-99	TCZ-150	NP0-334-151	MC236	
C61	.1	400	250212-13	DF-104		PT401	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No	RATING: CAP	VOLT	REPLACEMENT DATA: MAGNAVOX PART No	CENTRALAB PART No	ERIE PART No	MALLORY PART No	NOTES
C62A	2200		⌀250186-1	⌀PC-100	⌀1408-01	UC-5322	
B	4700					UC-5327	
C	4700					UC-5347	
C63	5000		250218-13			MCD265	
C64	1000		250218-8		811-102	MCB255	
C65	2700		250180-1069				
C66	.047	400	250212-7	DF-503			
C67	.1	400	250211-13	DF-104		PT401	
C68	.0033	600	250201-4	DF-332	GP2-333-332	PT6333	
C69	.047	400	250211-11	DF-503		PT4147	
C70	1000		250218-8		811-102		
C71	1000		250218-8		811-102		
C72	.1	800	250201-13	DF-104		PT601	
C73	.0047	400	250212-4				
C74	.047	200	250212-5			PT401	
C75	3900	500	250181-5041				
C76	1000		250218-8		811-102	MCB255	
C77	33	500	250159-5059				
C78	470	500	250155-5063				
C79	1000		250218-8		811-102	MCB255	
C80	.047	400	250211-11	DD-503		PT4147	
C81	.047	400	250211-11	DD-503		PT4147	Note 5
C82	1000						Note 5
C83	68	4000	250175-23	DD69-680			
C84	.1	400	250212-13	DF-104		PT401	
C85A	30000		250218-3	DD5-103	811-01	DC-521	
B	10000				811-01	DC-521	
C86	.0068	400		D6-682	GP3-333-682		Note 5

⌀ Items C62A, C62B, C62C, R73A, R73B and R73C are combined in one unit.
Note 3. Some versions may use a .001MFD unit in this application (part #250218-8).
Note 4. Some versions may use a .015MFD unit in this application.
Note 5. Not used in some versions.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: MAGNAVOX PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No	MALLORY PART No	INSTALLATION NOTES
R1A	1Meg	½	220126-48	AB-70	A47-1Meg-Z	QI3-137	U-53	Volume
B	Shaft		Not Req.	AK-3	FS-3	Not Req.	U6-26	Attach to R1A.
C	Switch		Not Req.	KB-1	SWR-12	76-1	U6-26	Attach to R1A.
R2A	1.25Meg	½	230129-9	AB742	A47-1.5Meg-S	QII-136	TA255L	Vertical Hold
B	Shaft		Not Req.	AK-8	FS-3	VQ	Not Req.	Attach to R2A.
R3A	100KΩ	½	230129-10	B-40	A47-100K-S	QII-138	TA25L	Brightness
B	Shaft		Not Req.	Not Req.	FS-3	VQ	Not Req.	Attach to R3A.
R4A	500KΩ	½	220126-47	B-59	A47-500K-S	QII-133	U-50	Tone-See Note 1
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R4A.
R5A	2Meg	½	220129-3	AB-58	A47-2SK-S	QII-120	TA251L	Horizontal Hold
B	Shaft		Not Req.	AK-8	FS-3	VQ	Not Req.	Attach to R5A.
R6A	2000Ω	½	220126-45	AB-705		QI7-112	U-7	Contrast
B	Shaft		Not Req.	AK-3		Not Req.	Not Req.	Attach to R6A.
R7A	2.5Meg	½	220145-2	AB-83	A47-2.5Meg-S	QII-239	TA255L	Height
B	Shaft		Not Req.	AK-1	FAS-1/4	Not Req.	Not Req.	Attach to R7A.
R8	3000Ω	2	230120-3		39-3000			Vertical Linearity

Note 1. Part Number 220126-47 used as an alternate in some versions, tone control not used in some versions.

RESISTORS

ITEM No.	RATING: OHMS	WATTS	REPLACEMENT DATA: MAGNAVOX PART No.	IRC PART No.	NOTES
R9	100KΩ	½	230104-86	BTS-100K	
R10	100KΩ	½	230104-86	BTS-100K	
R11	22KΩ	1	230104-74		
R12	1200Ω	1	230105-83	BTA-1200	
R13	100Ω	2	230104-90	BTS-100	
R14	100KΩ	½	230104-86	BTS-100K	
R15	470KΩ	½	230104-94	BTS-470K	
R16	470KΩ	½	230104-94	BTS-470K	
R17	470Ω	1		BTS-470	
R18	680Ω	½	230104-80	BTS-680	
R19	8200Ω	½	230104-73	BTS-8200	
R20	22KΩ	½	230104-78	BTS-22K	
R21	150Ω	½	230104-52	BTS-150	
R22	33KΩ	½	230104-90	BTS-33K	
R23	330KΩ	½	230104-92	BTS-330K	
R24	68KΩ	½	230104-85	BTS-68K	
R25	470KΩ	½	230104-94	BTS-470K	
R26	3300Ω	½	230104-68	BTS-3300	
R27	115Ω	1	230105-78	BTS-115	Note 1
R28	100Ω	½	230104-50	BTS-100	
R29	115Ω	1	230105-78	BTS-115	Note 1
R30	1Meg	½	230104-98	BTS-1Meg	
R31	10KΩ 5%	½	230094-183		
R32	1000Ω	½	230104-62	BTS-1000	
R33	56Ω	2	230104-47	BTS-56	
R34	100Ω	½	230104-82	BTS-1000	
R35	15KΩ 5%	½	230094-187	BTS-15K 5%	
R36	1000Ω	½	230104-62	BTS-1000	
R37	47Ω	½	230104-47	BTS-56	
R38	10KΩ 5%	½	230094-183	BTS-10K	
R39	1000Ω	½	230104-62	BTS-1000	
R40	330Ω	½	230104-54	BTS-330	
R41	1Meg	½	230104-98	BTS-1Meg	
R42	5.6MΩ 5%	½	230094-177	BTS-5.6MΩ 5%	
R43	1Meg	½	230104-98	BTS-1Meg	
R44	27KΩ	1	230105-79	BTA-27K	
R45	270KΩ	½	230104-91	BTS-270K	
R46	330KΩ	½	230104-92	BTS-330K	
R47	470KΩ	½	230104-94	BTS-470K	
R48	5800Ω	2	230106-71	BTB-5800	
R49	1000Ω	½	230104-62	BTS-1000	
R50	82Ω	½	230104-49	BTS-82	
R51	270KΩ	½	230104-91	BTS-270K	
R52	47KΩ	½	230104-93	BTS-47K	
R53	33KΩ	½	230104-90	BTS-33K	
R54	1000Ω	½	230104-62	BTS-1000	
R55	100KΩ	½	230104-86	BTS-100K	
R56	100KΩ	½	230104-86	BTS-100K	
R57	68KΩ	½	230104-84	BTS-68K	

ITEM No.	RATING: OHMS	WATTS	REPLACEMENT DATA: MAGNAVOX PART No	IRC PART No	NOTES
R58	4.7Meg	½	230104-106	BTS-4.7Meg	
R59	470KΩ	½	230104-94	BTS-470K	
R60	1.2Meg 5%	½	230094-233	BTS-1.2Meg 5%	
R61	1Meg 5%	½	230094-231	BTS-1Meg 5%	
R62	3300Ω	1	230105-68	BTA-3300	
R63	270Ω	2	230105-55	BTB-270	
R64	10KΩ	½	230104-74	BTS-10K	
R65	470KΩ	½	230104-94	BTS-470K	
R66	4.7Meg	½	230104-106	BTS-4.7Meg	
R67	680KΩ	½	230104-96	BTS-680K	
R68	1Meg	½	230104-98	BTS-1Meg	
R69	22KΩ	½	230104-78	BTS-22K	
R70	3300Ω 5%	½	230094-171	BTS-3300 5%	
R71	3000Ω 5%	½	230094-170	BTS-3000 5%	
R72	220Ω	½	230104-54	BTS-220	
R73A	22KΩ	½		BTS-22K	
B	8200Ω	½	⌀250186-1	BTS-8200	
C	8200Ω	½		BTS-8200	
R74	47KΩ	½	230104-82	BTS-47K	
R75	1Meg	½	230104-98	BTS-1Meg	
R76	270KΩ	½	230106-91	BTA-270K	
R77	1.5MegΩ 5%	½		BTS-1.5MegΩ 5%	Note 2
R78	1.5Meg	1	230105-99	BTA-1.5Meg	
R79	1.5Meg	1	230105-99	BTS-1.5Meg	
R80	NTC		230130-1		Note 3
R81	12KΩ	½	230104-76	BTS-12K	
R83	1000Ω	½	230104-62	BTS-1000	
R84	220Ω	½			Note 4
R85	220Ω	½			Note 4
R86	1MΩ	1	230106-61		
R88	100KΩ	½	230104-86	BTS-100K	
R89	100KΩ	½	230104-86	BTS-100K	
R90	470KΩ	½	230104-94	BTS-470K	
R91	68000 5%	½	230094-179		
R92	15000 5%	½	230094-163	BTS-1500 5%	
R93	82KΩ	½	230104-85		
R94	120KΩ	½	230094-211		
R95	470KΩ	½	230104-75	BTS-12K	
R96	470KΩ	½	230104-94		
R97	10KΩ	5	240071-9	PW10-10K	
R98	15000Ω	½	230105-64	BTA-1500	
R99	680Ω	½	230104-72		
R99	15KΩ	1	230105-78	BTA-15K	
R100	5.9Ω	1	230107-2	PW1-5.9	
R101	1200Ω	1	230105-83	BTA-1300	
R102	560Ω	½	230104-60	BTS-560	
R103	130KΩ	½	230130-1	BTS-130K	

Note 1. Used only with models using a UHF Tuner.
Note 2. Some versions use a 1.5Meg 1W 5% resistor in this application.
Note 3. Negative temperature compensating. Do not measure.
Note 4. Some versions use a 180Ω 1W resistor in this application.
• Items C62A, C62B, C63C, R73A, R73B, R73C are combined in one unit.

TRANSFORMER (POWER)

ITEM No	RATING: PRI	SEC. 1	SEC. 2	REPLACEMENT DATA: MAGNAVOX PART No	Halldorson PART No	Merit PART No	RCA TYPE No	Stancor PART No	Thordarson PART No	Triad PART No
T1	117VAC @1.68A	585VCT @240ADC	5VAC @3A	D300077G-1		P-3077 ②		P-8331 ② ③		
	SEC. 3	SEC. 4	SEC. 5	300077-1 ①						
	6.3VAC @8.9A									

① Alternate power trans.
② Use original mounting feet.
③ Parallel and phase 6.3V windings for Sec. 3

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: MAGNAVOX PART No	Halldorson PART No	Merit PART No	RCA TYPE No	Rem PART No	Stancor PART No	Thordarson PART No	Triad PART No
T2	Horiz. Output Trans.	380614							
T3	Vert. Output Trans.	320067-2		Z1808		A-3039	228T1	V312	A-8141	FLY-79 *	
T4A	Yoke(90°)	380817-1		DF607 ①		MDP-82 ②	235D1 ②		DY-16A ②	26854	A-104X
B	Horiz.(45MH)	380589-7 ①								Y-16 ①	Y-41-1 ②
T5	Width Coil(.23-3.3MH)	380565-2								WC-24	
	(6.3-22MH)										

① Alternate Magnavox part number.
② Use original yoke damping network.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Rem Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	8						8	
	5						5	
	3						3	
	2						2	
	1						1	
Connect Width Coil Across	1 & 2						1 & 2	

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE: PRI	SEC	REPLACEMENT DATA: MAGNAVOX PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T6	3.5KΩ	2.6Ω	320068-2	Z1010	A-3018	A-3849	26850	S-53X	

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V C IMP	REPLACEMENT DATA: MAGNAVOX PART No	OUAM PART No	NOTES
SP1	8"	PM	5 4Ω	583686	8A4425	
SP2	8"	PM	5 4Ω	583687	8A425	

COILS (RF-IF)

ITEM No	USE	DC RES: PRI	SEC.	REPLACEMENT DATA: MAGNAVOX PART No.	MEISSNER PART No	MERIT PART No	MILLER PART No	NOTES
L1	UHF Ant. Coil	0Ω						
L2	UHF Ant. Coil							
	Ind Inductor	0Ω		250188-8				
L3	UHF Ant. Coil							
	Ind Inductor	0Ω		380415-44				
L4	UHF RF Coil	0Ω						
L5	UHF RF Coil							
	Ind Inductor	0Ω		380188-8				
L6	UHF Osc. Coil	0Ω						
L7	UHF Osc. Coil							
	Ind Inductor	0Ω						
L8	UHF Osc. Coil							
	Ind Inductor	0Ω						
L9	UHF Osc. Coil							
	Ind Inductor	0Ω						
L10	UHF Osc. Coil							
	Ind Inductor	0Ω						
L11	Fil. Choke	0Ω		380574-8				
L12	Fil. Choke	0Ω		380574-8				
L13	Fil. Choke	0Ω		380574-8				
L14	Cathode Choke	1.4Ω		380522-7				
L15	RF Coil	0Ω		380574-8				
L16	UHF IF Coil	0Ω		380574-12				
L17	RF Choke	0Ω		380574-14				
L18	IF Trap	0Ω						
L19	IF Trap	0Ω						
L20	VHF Ant. Trans	0ΩCT	0Ω	380490-3				
L21	IF Trap	.22Ω		380601-8				.47 Microhenries, IRC Part #CLA
L22	VHF Ant. Coils	0Ω						
L23	UHF IF Coil	0Ω		380603-1				
L24	Neut. Coil	0Ω						Channel 13
L25	VHF RF Coil	0Ω						
L26	VHF RF Coils	0Ω						
L27	UHF IF Coil	0Ω						
L28	VHF Mixer Grid Coil	0Ω						Channel 13
L29	VHF Mixer Grid Coils	0Ω						
L30	VHF Osc. Coil	0Ω						Channel 13
L31	VHF Osc. Coil	0Ω						
L32	VHF Osc. Coils	0Ω						Channel 6
L33	VHF Osc. Coil	0Ω						1 Microhenry
L34	RF Coil	3.1Ω		380601-9				
L35	Coup. Plate	.1Ω		380603-1				
L36	1st Video IF	.1Ω		380540-1	17-4534*	TV-130a	6219a	
L37	2nd Video IF	.1Ω	.1Ω	380581-1	17-4522	TV-130	6219	
L38	3rd Video IF	.1Ω	.1Ω	380582-1	17-5003a	TV-128a	6233a	Includes 47.25MC Trap

MAGNAVOX CHASSIS CMUA440AA, CMUA441AA, CMUA442AA, CTA440AA, CTA441AA, CTA442AA

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: MAGNAVOX PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L39	Shunt Peaking Coil	12.5Ω		360443-37	19-3660		4650	670 Microhenries
L40	Series Peaking Coil	9.5Ω		360443-39	19-3300▲	TV-190▲	6155▲	340 Microhenries, wound on 47KΩ resistor
L41	Shunt Peaking Coil	11.5Ω		360443-28	19-3500		6174	450 Microhenries
L42	1st Sound IF	.5Ω		360584-1	20-1005	TV-151	1469	
L43	2nd Sound IF	.5Ω		360584-1	17-3400	TV-151	1469	
L44	Discriminator	1.3Ω	1.3ΩCT	360613-1	17-3496	TV-114	6205	
L45	Horiz. Osc.	58Ω		360579-1	19-1578	TV-163	6210	

* Use winding with 56KΩ shunt resistor.
■ Use one winding only.
▲ Use adaptor plate.
▲ Parallel with 47KΩ resistor.

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D. C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA: MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L46	.240ADC	36.4Ω	.56HY	320058-2			C-2328 ①		

① Drill one new mounting hole.

FUSES

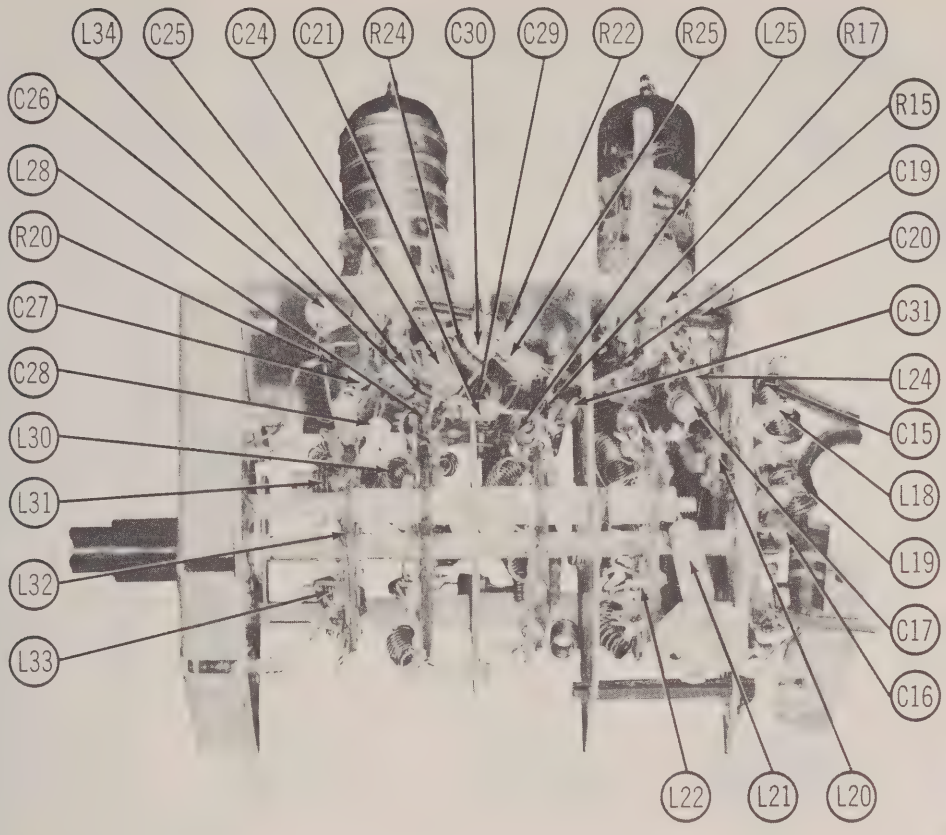
ITEM No.	TYPE	RATING	REPLACEMENT DATA: MAGNAVOX PART No. FUSE	MAGNAVOX PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG S/B	150MA 125V	180157-24		313.150 (3AG S/B 150MA)	357001	MDL 15/100	4405

CRYSTAL DIODES

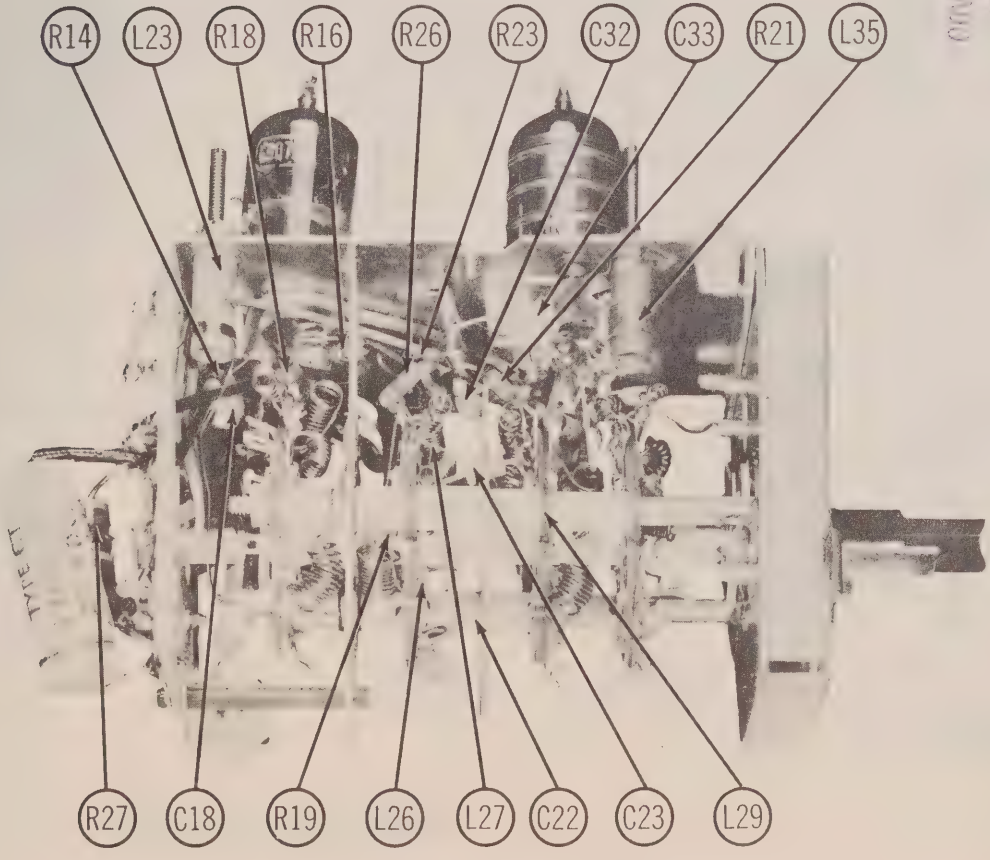
ITEM No.	ORIG. TYPE	REPLACEMENT DATA: MAGNAVOX PART No.	REPLACEMENT DATA: SYLVANIA PART No.	NOTES
M2	4JB2C6	530036-1	1N82 or 1N82A	UHF Mixer
M3	1N64		1N60	Video Det.

MISCELLANEOUS

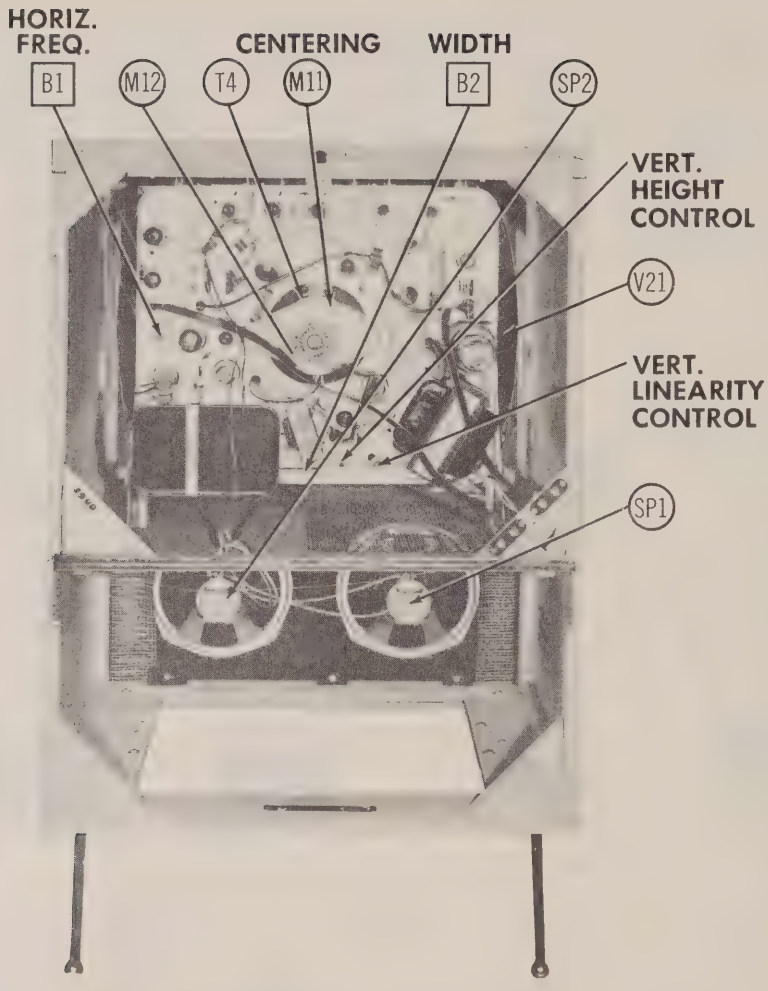
ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M4	Dial Light		#47 - VHF - All chassis
M5	Dial Light		#47 - UHF-Chassis CMUA440AA, CMUA441AA, CMUA442AA
M6	Tuner	700458-1	VHF - All chassis
M7	Tuner	700459-1	UHF - Chassis CMUA440AA, CMUA441AA, CMUA442AA
M8	Video Det. Assy.	360607-1	Includes M3, coils, capacitor and resistor
M9	Switch	160247-1	VHF-UHF (Rotary-wafer type) - Chassis CMUA440AA, CMUA441AA, CMUA442AA
M10	Switch	160169-3	Fringe - local (DPDT-Rotary, wafer type)
M11	Centering Device	635116-1	
M12	Ion Trap	360492-5	



VHF TUNER-RIGHT SIDE



VHF TUNER-LEFT SIDE



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control to its mid-range position.

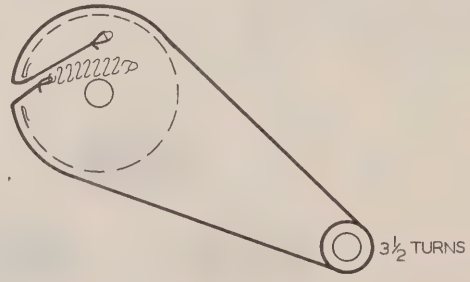
Turn the horizontal frequency slug (B1) slowly clockwise while switching on and off channel until picture just loses sync.

Turn B1 counter clockwise until picture regains sync, then continue $\frac{1}{2}$ turn in the same direction.

The picture should hold syne at both extreme ends of the horizontal hold control.

If necessary, readjust B1 slightly and test for sync or pull in, as above.

Adjust the width slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.



TUNING PULLEY MAX. COUNTER CLOCKWISE POSITION

UHF DRIVE CORD STRINGING

RETMA MEMBER

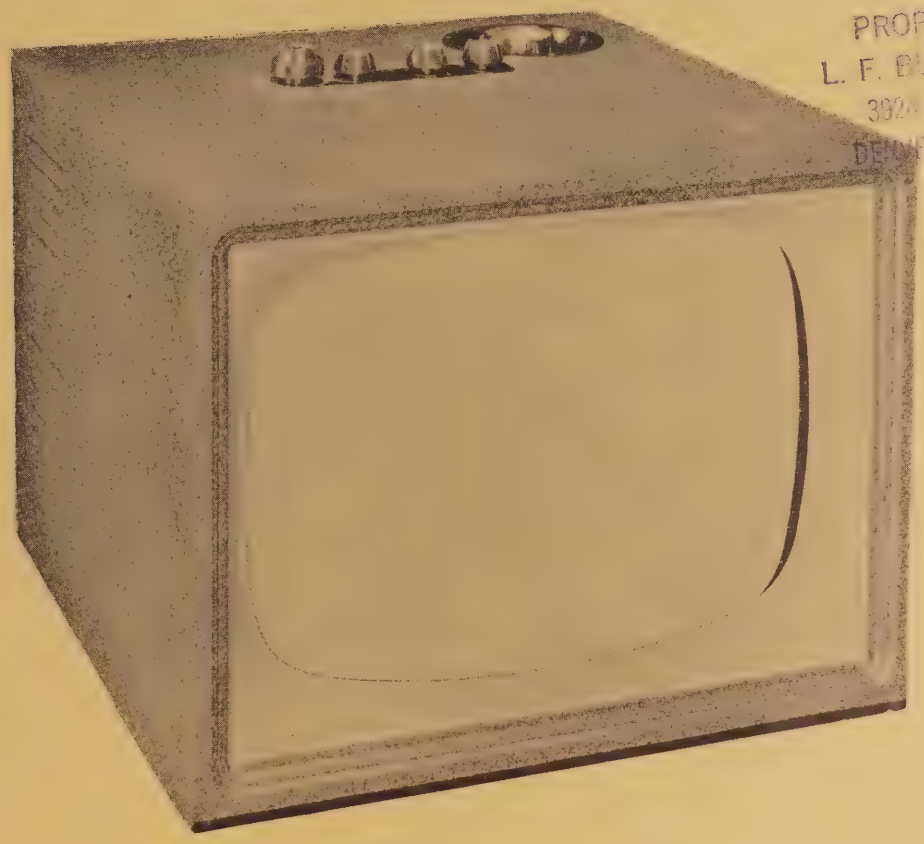
MAJESTIC MODELS 40 (Series 125), 50, 52 (Series 126)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MAJESTIC MODEL 50 (SERIES 126)

TRADE NAME	Majestic Models 40 (Series 125) 50, 52 (Series 126)
MANUFACTURER	Majestic Radio & Television, Div. of Wilcox Gay Corp., 70 Washington St., Brooklyn, N.Y.
TYPE SET	Television Receiver
TUBES	Fifteen
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING 1.18 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 24.75MC, Sound IF 20.25MC (Intercarrier)

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MAJESTIC MODELS 40 (Series 125), 50, 52 (Series 126)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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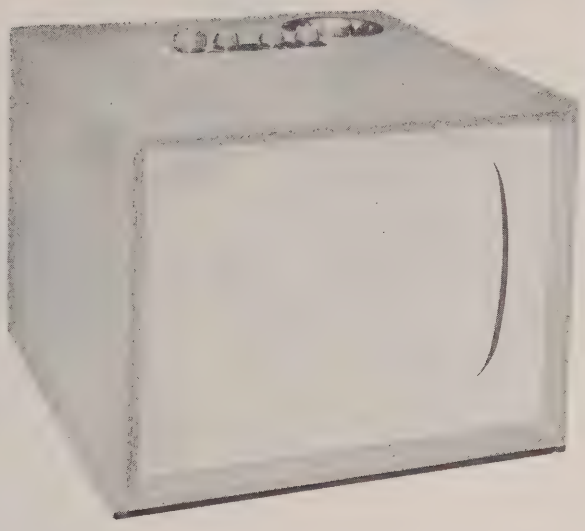
MAJESTIC MODELS 40 (Series 125), 50, 52 (Series 126)

MAJESTIC MODELS 40 (Series 125), 50, 52 (Series 126)

DISASSEMBLY INSTRUCTIONS

CABINET REMOVAL

1. Remove 7 push-on type control knobs from top panel of cabinet.
2. Remove 8 wood screws. Remove rear cover.
3. Remove 2 wood screws holding rear cabinet braces.
4. Disconnect speaker plug.
5. Remove 5 bolts from under chassis mounting board (Note: Remove only the 5 bolts around the edges.)
6. Remove cabinet.
7. Remove 2 speaker nuts. Remove speaker.



MODEL	CHASSIS
40	Series 125
50, 52	Series 126

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet to the right of the channel selector shaft.

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

To adjust the horizontal oscillator circuit it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, it is necessary to remove the rear cover and supply power to set. Adjust the AM rejection control (R7) for maximum volume and minimum buzz.

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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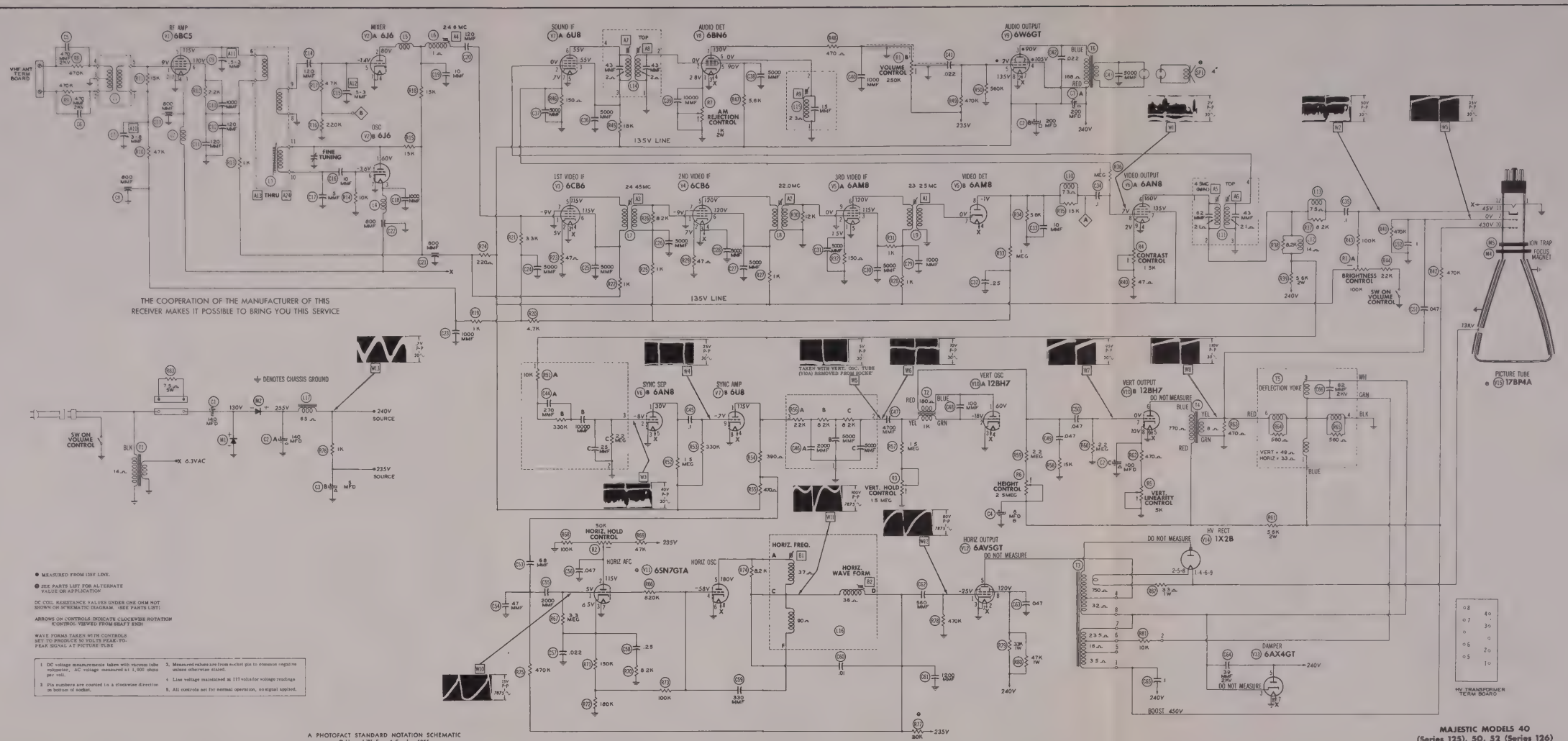

● MEASURED FROM 135V LINE.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM. -SEE PARTS LIST-

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings
5. All controls set for normal operation, no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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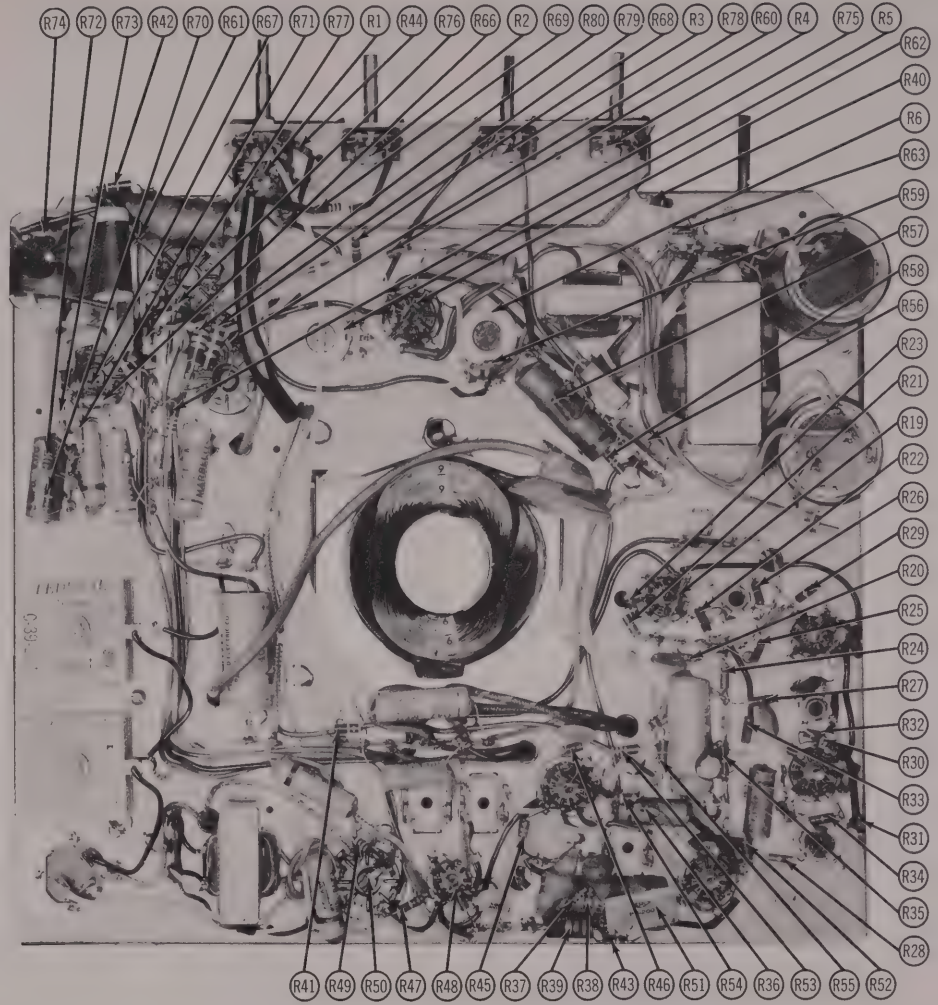
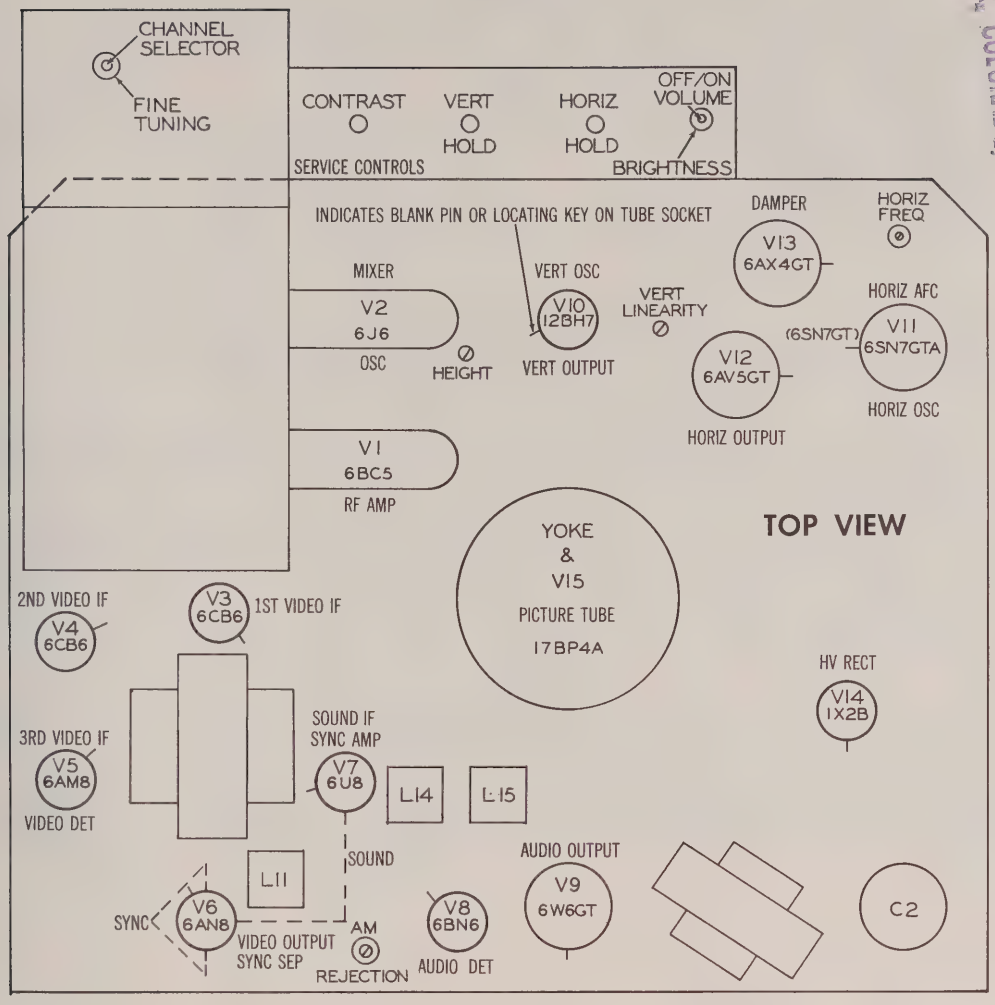
MAJESTIC MODELS 40
(Series 125), 50, 52 (Series 126)

MAJESTIC MODELS 40
(Series 125), 50, 52 (Series 126)



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifiers (M1 & M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6, V9**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V15**
Has pic, no sound - **V7, V8, V9**

SYNC FAILURE
No vert. sync - **V7, V10**
No horiz. sync - **V7, V11**
No vert. or horiz. sync - **V6, V7**

SWEEP FAILURE
No raster, has sound - **V11, V12, V13, V14, V15**
No vertical deflection - **V10**
Poor vert. linearity or foldover - **V10**
Poor horiz. linearity or foldover - **V11, V12, V13**
Narrow picture - **V11, V12, V13, V14, M1, M2**
Vert. off freq. - **V7, V10**
Horiz. off freq. - **V7, V11**

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from chassis.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C24. Connect the positive lead to chassis. Set the contrast control maximum counter clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	23.25MC (Unmod)	Any	DC probe to point (A). Common to chassis.	A1	Adjust for maximum deflection. Attenuate signal generator output to maintain not more than 1.5 volts at VTVM.
2.	"	"	22.0MC	"	"	A2	"
3.	"	"	24.45MC	"	"	A3	"
4.	"	"	24.6MC	"	"	A4	"

OVERALL VIDEO IF RESPONSE CHECK

If sweep generator has no built-in marker, loosely couple separate marker generator to sweep generator output. Sweep and marker generator output should be kept low to prevent distortion of response curve. Leave bias connected as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	23MC (10MC Swp)	20.25MC 21.75MC 24.75MC	Any	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.		Check for response curve similar to Fig.1. If necessary, retouch A1 thru A4 for desired response.

4.5MC TRAP ALIGNMENT

Set contrast control fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	Direct	High side to point (A). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe thru detector (Fig.2) to pin 11 (cathode) of picture tube. Common to chassis.	A5	Adjust for MINIMUM deflection.

ALTERNATE 4.5MC TRAP ALIGNMENT

Remove bias battery. Replace the original 6J6 in its socket. Tune in a TV station and adjust A5 for minimum 4.5MC beat interference in picture.

SOUND IF ALIGNMENT USING ON THE AIR SIGNAL

Return set to normal operating conditions. Turn the set on and tune in a strong TV station. Turn the AM rejection control (R7) 90 degrees from maximum clockwise rotation. Adjust A9 for maximum volume. Reduce the signal strength into the receiver by inserting an attenuator in series with the antenna and receiver antenna terminals. If a suitable attenuator is not available, remove the antenna from the antenna terminals and stray feed the signal into the receiver by placing the antenna near the antenna terminals. Adjust A6, A7, and A8 for maximum volume. Adjust R7 for minimum noise. Reconnect antenna and readjust A9 for maximum volume. If necessary, reduce volume so that this peak can be heard.

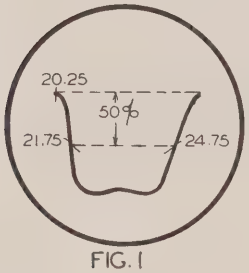


FIG. 1

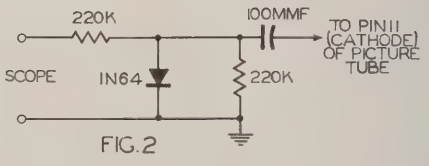


FIG. 2

ALIGNMENT INSTRUCTIONS (cont)

RF AND MIXER ALIGNMENT

Remove bias battery used in video IF Alignment and connect a short across C24.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC. 209.75MC	12	Vert. Amp. thru 10KΩ to point (B). Low side to chassis.	A10, A11, A12	Adjust for response curve similar to Fig.3 with markers at not less than 70%.
8.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check all channels for proper marker placement. If markers fall below 70% on any channel make slight compromise adjustment of A10, A11 and A12 with channel selector set for that channel. Recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

OSCILLATOR ALIGNMENT

The channel adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel. Remove the dummy converter tube and replace the original 6J6 in its socket.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A13	Adjust to place sound marker as shown in Fig. 4. Video marker should be at 50% on response curve.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A14	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A15	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A16	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A17	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A18	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A19	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A20	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A21	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A22	
			63MC (10MC Swp)	61.25 MC 65.75MC	3		A23	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A24	

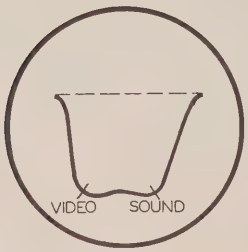


FIG. 3

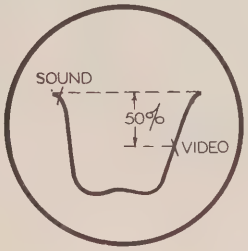
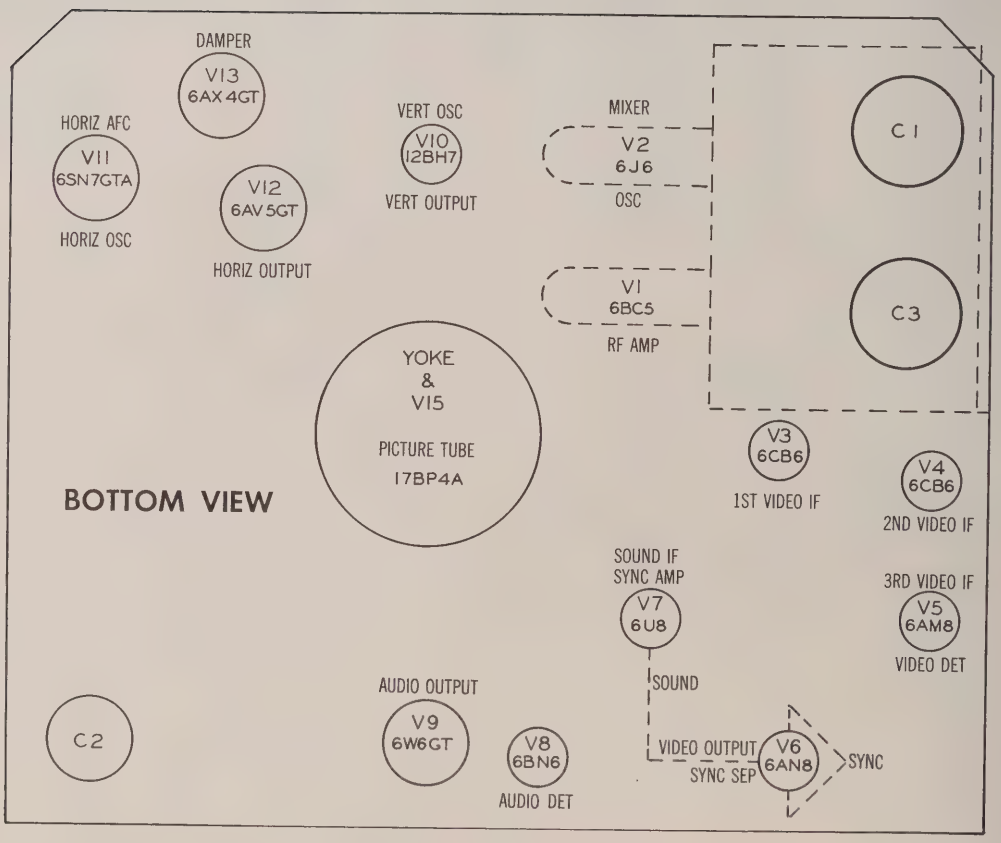


FIG. 4

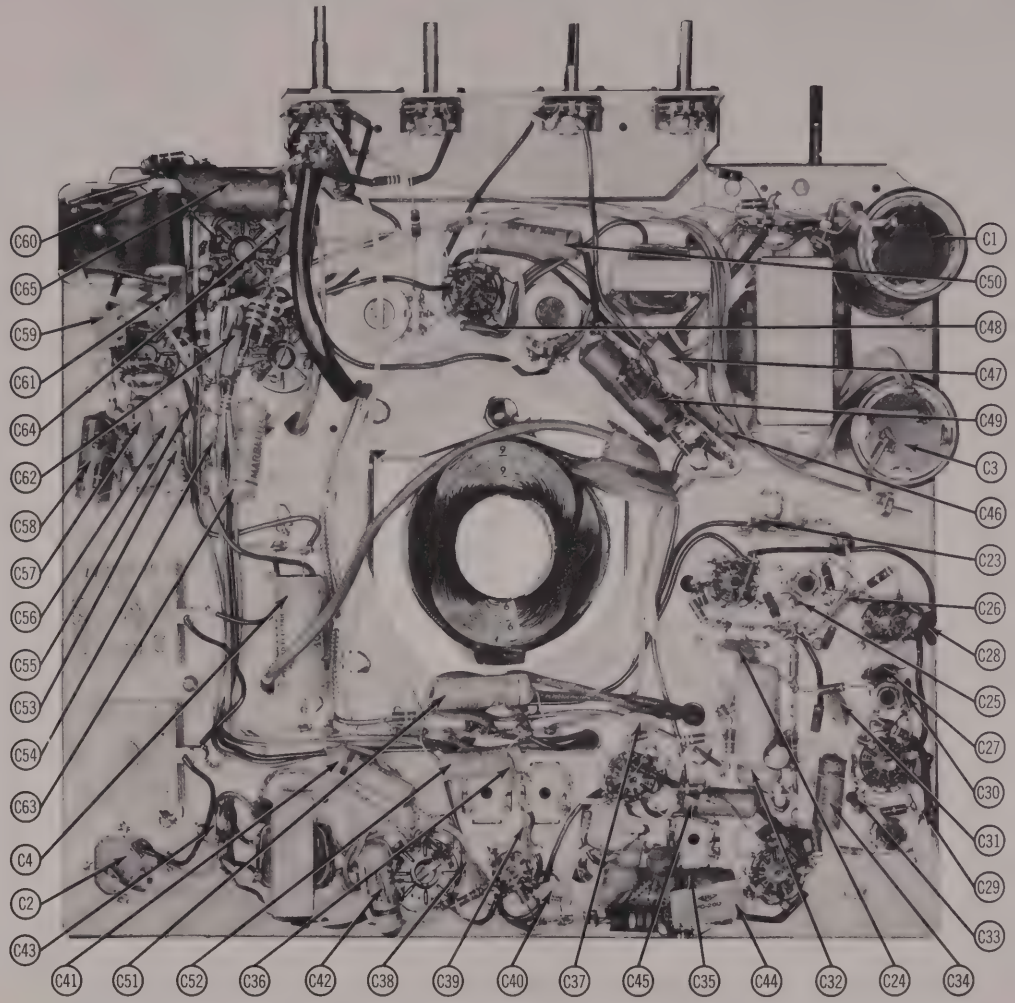
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	1Meg	0Ω	.1Ω	0Ω	■1.2KΩ	■3.4KΩ	0Ω		
V 2	6J6	■15KΩ	■15KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6CB6	1Meg	47Ω	0Ω	.1Ω	■1.2KΩ	■1.2KΩ	0Ω		
V 4	6CB6	1Meg	47Ω	0Ω	.1Ω	■1KΩ	■1KΩ	0Ω		
V 5	6AM8	150Ω	.3Ω	■2KΩ	.1Ω	0Ω	■1KΩ	.5Ω	5.6KΩ	0Ω
V 6	6AN8	■1.5Meg	2.2Meg	0Ω	0Ω	.1Ω	†5.6KΩ	80KΩ	1Meg	550Ω
V 7	6U8	■900Ω	2.1Ω	■18KΩ	.1Ω	0Ω	■18KΩ	150Ω	0Ω	400KΩ
V 8	6BN6	350Ω	2Ω	0Ω	.1Ω	■5.6KΩ	2.3Ω	†250KΩ		
V 9	6W6GT	NC	0Ω	†250Ω	†65Ω	300KΩ	TP	.1Ω	80KΩ	
V 10	12BH7	▲3Meg	2Meg	0Ω	.1Ω	.1Ω	▲6.5KΩ	2.2Meg	700Ω	0Ω
V 11	6SN7GTA	1Meg	†70KΩ	350KΩ	300KΩ	†30KΩ	0Ω	0Ω	.1Ω	
V 12	6AV5GT	470KΩ	.1Ω	0Ω	NC	▲32Ω	NC	0Ω	†25KΩ	
V 13	6AX4GT	TP	NC	350KΩ	NC	†65Ω	NC	.1Ω	0Ω	
V 14	1X2B		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▲780Ω
V 15	17BP4A	0Ω	470KΩ	PIN 10 ▲470KΩ	PIN 11 ■180KΩ	PIN 12 .1Ω				

■MEASURED FROM 135V LINE.
†MEASURED FROM OUTPUT OF M2.
▲MEASURED FROM PIN 3 OF V13.
NC-NO CONNECTION.
TP-TIE POINT.

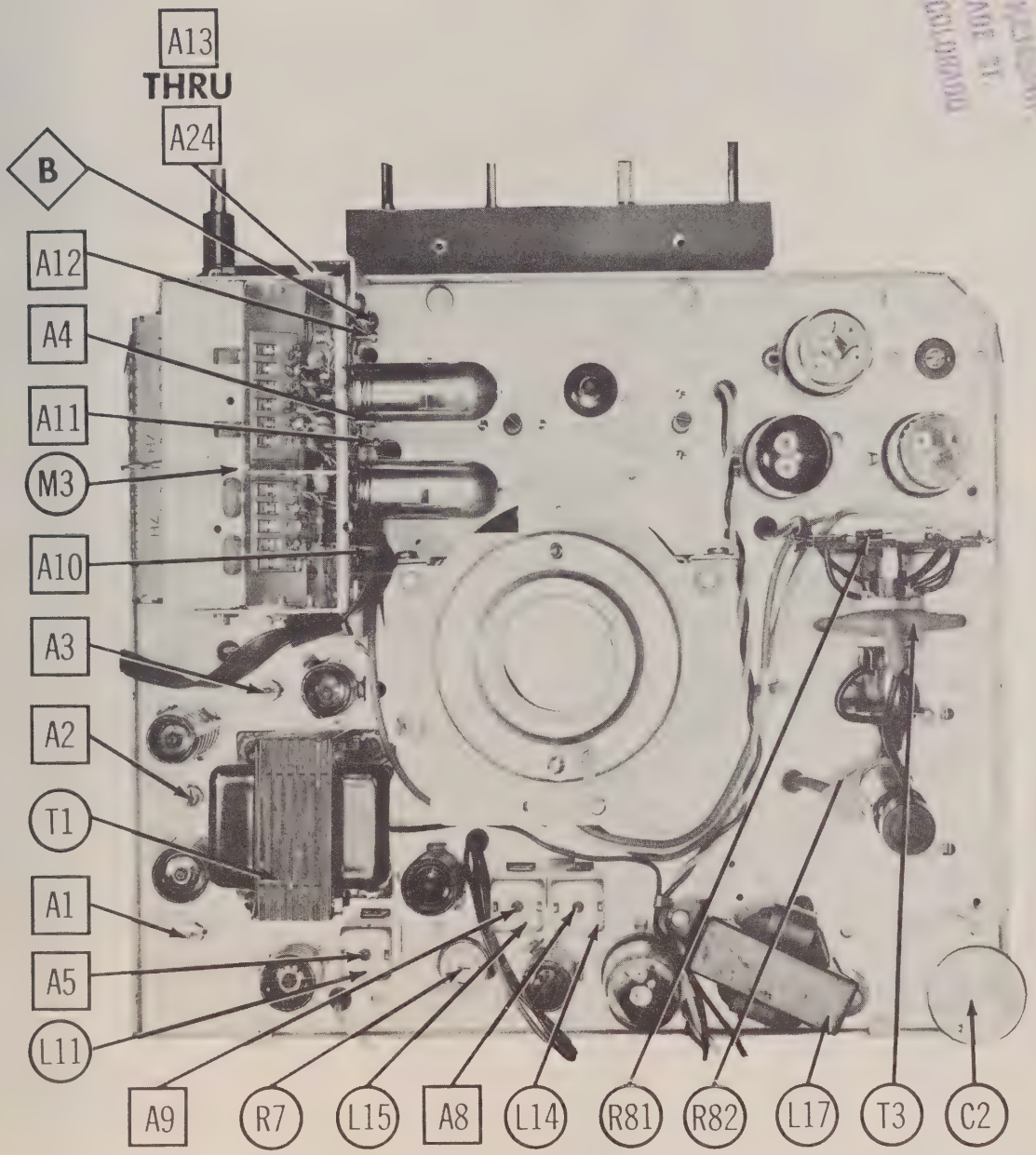


TUBE PLACEMENT CHART



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

PROPERTY OF
E. T. BLANKENSHIP
3954 MEADE ST.
DENVER, COLORADO



CHASSIS TOP VIEW

SET 304 FOLDER 10

4 MEADE ST.
ER, COLORADO

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: MAJESTIC PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amp.	6BC5	6BC5	7BD	
V2	Mixer-Osc.	6J6	6J6	7BF	
V3	1st Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd Video IF Amp. - Video Det.	6AM8	6AM8	9CY	
V6	Video Output - Sync Sep.	6AN8	6AN8	9DA	
V7	Sound IF Amp. - Sync Amp.	6U8	6U8	9AE	
V8	Audio Det.	6BN6	6BN6	7DF	
V9	Audio Output	6W6GT	6W6GT	7AC	
V10	Vert. Osc. - Vert. Output	12BH7	12BH7	9A	
V11	Horiz. AFC - Horiz. Osc.	6SN7GTA	6SN7GTA	8BD	6SN7GT used as an alternate.
V12	Horiz. Output	6AV5GT	6AV5GT	6CK	
V13	Damper	6AX4GT	6AX4GT	4CG	
V14	HV Rect.	1X2B	1X2B	9Y	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: MAJESTIC PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V15	17BP4A	17BP4A	17BP4A	17BP4A	17BP4	12N	① Aluminized
			17BP4B ①	17BP4B ①		12N	② Silver screen
	14CP4A	14CP4	14CP4	14CP4	14CP4	12N	

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP	RATING: VOLT	REPLACEMENT DATA: MAJESTIC PART No.	REPLACEMENT DATA: MALLORY PART No.	REPLACEMENT DATA: PYRAMID PART No.	REPLACEMENT DATA: SANGAMO PART No.	NOTES
C1	140	300	C-5.545-3	FP231	TM-150-300	S-200	
C2A	≈140	300	C-5.545-1		TM-201	Q-182	
B	≈200	150			TD-150-300	MT-1580	
C	≈100	50					
C3A	≈200	150	C-5.545-5	FP316.1	TM-3039	D-068	
B	≈5	150					
C4	5	450		TCY1	TD-5-450	FM-4506	Note 1

Note 1. Some versions use 4MFD in this application (part #B-5.418).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT.	REPLACEMENT DATA: MAJESTIC PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: MALLORY PART No.	NOTES
C5	470	3000	B-4.129-2	DD30-471	5KV-471	DC3034	
C6	470	3000	B-4.129-2	DD30-471	5KV-471	DC3034	
C7	3-8			829-10			
C8	600						
C9	6-8			829-10	3115-01-GR6	CT65A	
C10	1000			DD-103	801-001	DC-521	
C11	180			DD-181	811-121	UC-5312	
C12	120			DD-121	811-151	UC-5312	
C13	800						
C14	120			DD-121	811-121	UC-5315	
C15	.5-3			829-3	3115-01-GR5	CT65A	
C16	10			TCE-10	MP0A-100	ET-541	
C17	5						
C18	1000			DD-102	801-001	DC-521	
C19	10			TCE-10	MP0A-100	ET-541	
C20	120			DD-121	811-121	UC-5312	
C21	800						
C22	800						
C23	1000		C-4.125-5	DD-103	801-001	DC-521	
C24	5000		B-4.125-1	DD-502	811-005	DC-525	
C25	5000		B-4.125-1	DD-502	811-005	DC-525	
C26	5000		B-4.125-1	DD-502	811-005	DC-525	
C27	5000		B-4.125-1	DD-502	811-005	DC-525	
C28	5000		B-4.125-1	DD-502	811-005	DC-525	
C29	1000		C-4.125-28	DD-103	801-001	DC-521	
C40	1000		C-4.343-28	DD-103	801-001	DC-521	
C41	.033	400	D-3.105-27	DF-303	81Y-03	DT4122	
C43	.033	400	D-3.105-27	DF-303	81Y-03	DT4122	
C43	5000		B-4.125-1	DD-502	811-005	DC-525	
C44A	270				GP2K-471	UC-5327	
B	10000		†B-10.306	†PC-360	811-01	DC-511	
C	25				GP2K-250	UC-5425	
C45	.1	300	C-3.208-8	DF-104		PT401	
C46A	2000					DC-522	
B	5000		♦B-10.101	♦PC-100	♦4406-01	DC-535	
C	5000					DC-525	
C47	4700	500	D-4.105-24			MCD465	
C48	100		C-4.109-10	DG-101	GP2K-101	DC-531	
C49	.047	600	D-3.105-11				
C50	.047	400	D-3.105-19	DF-503		PT4147	
C51	.047	400	D-3.105-19	DF-503		PT4147	
C52	.1	300	C-3.208-8	DF-104		PT401	
C53	68		C-4.109-36	DG-680	GP2K-680	UC-5468	
C54	47		C-4.109-30	TCH-47	NT50K-470	NT-5447	
C55	5000		C-4.343-34	DD-502	811-005	DC-522	
C56	.047	400	D-3.105-19	DF-503		PT4147	
C57	.033	400	D-3.105-27	DF-303	81Y-03	PT4123	
C58	.25	300	C-3.208-9			PT4025	
C59	330	500	D-4.104-59	DG-331	81J-331		
C60	.01	600	C-3.105-1				
C61	1200	500	D-4.105-9				
C62	680	500	D-4.104-70	DG-681	GP2K-561	UC-5356	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No	RATING: CAP	RATING: VOLT	REPLACEMENT DATA: MAJESTIC PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: MALLORY PART No.	NOTES
C63	.047	400	D-3.105-19	DF-503		PT4147	
C64	39	2000	B-4.129-2	DD30-390			
C65	.1	600	D-3.105-31	DF-104		PT601	
C66	.02	2000	B-4.129-10				

† Items C44A, C44B, C44C, R51A, R51B and R51C are combined in one unit.
♦ Items C46A, C46B, C46C, R56A, R56B and R56C are combined in one unit.

CONTROLS

ITEM No	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MAJESTIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	100KΩ	½	C-5.336-4	F1-31	RTY-533	QJ-858*	UV51L	Brightness (Panel)
B	250KΩ	½		B3-35			UX254A	Volume (Rear)
C	Switch			KB-2			US-27	Attach to R1B.
R2A	50KΩ	½	C-5.336-1	B-21	A47-50K-S	QJ1-123	TA54L	Horizontal Hold
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A.
R3A	L. 5Meg	½	C-5.336-3	AB-742	A47-L5Meg-S	QJ1-138	TA15L	Vertical Hold
B	Shaft		Not Req.	AK-3	FS-3	Not Req.	Not Req.	Attach to R3A.
R4A	1500Ω	½	C-5.336-3	AB-515		QJ7-109	U-5	Contrast
B	Shaft		Not Req.	AK-3		Not Req.	Not Req.	Attach to R4A.
R5A	5000Ω	½	C-5.336-2	AB-10	A47-5000-S	QJ1-114	SU-14	Vertical Linearity
B	Shaft		Not Req.	AK-19	RN-3	TQ	Not Req.	Attach to R5A.
R6A	2.5Meg	½	C-5.336-1	AB-53	A47-2.5Meg-S	QJ1-239	TAP255L	Height
B	Shaft		Not Req.	AK-19	RN-3	TQ	Not Req.	Attach to R6A.
R7	1000Ω	2	B-5.337		39-1000			AM Rejection (Wire Wound)

*CONCENTRIKIT EQUIVALENT; K-2 KIT, BASE ELEMENTS AND SHAFTS; B11-126, P8-028, (Panel)
B13-130, R1-113, (Rear)
76-2 Switch

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MAJESTIC PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R8	470K	½	D-7.101-129	BTS-470K	
R9	470K	½	D-7.101-129	BTS-470K	
R10	47KΩ	½		BTS-47K	
R11	33KΩ	½		BTS-33K	
R12	2200Ω	½		BTS-2200	
R13	1000Ω	½		BTS-1000	
R14	10KΩ	½			
R15	15KΩ	½			
R16	220KΩ	½			
R17	470Ω	½		BTS-4700	
R18	15KΩ	½			
R19	1000Ω	½	D-7.101-17	BTS-1000	
R20	4700Ω	½	D-7.101-45	BTS-4700	
R21	3300Ω	½	D-7.101-37	BTS-3300	
R22	1000Ω	½	D-7.101-17	BTS-1000	
R23	47Ω	½	D-7.101-250	BTS-47	
R24	2200Ω	½	D-7.101-224	BTS-2200	
R25	1000Ω	½	D-7.101-17	BTS-1000	
R26	8200Ω	½	D-7.101-55		
R27	1000Ω	½	D-7.101-17	BTS-1000	
R28	1000Ω	½	D-7.101-17	BTS-1000	
R29	47Ω	½	D-7.101-250	BTS-47	
R30	13KΩ	½	D-7.101-83		
R31	1000Ω	½	D-7.101-17	BTS-1000	
R32	150Ω	½	D-7.101-248	BTS-150	
R33	1Meg	½	D-7.101-142	BTS-1Meg	
R34	5600Ω	½	D-7.101-46	BTS-5600	
R35	15KΩ	½	D-7.101-69	BTS-15K	
R36	1Meg	½	D-7.101-142	BTS-1Meg	
R37	8200Ω	½	D-7.101-55	BTS-8200	
R38	8200Ω	½	D-7.101-55	BTS-8200	
R39	5600Ω	½	D-7.103-118	BTS-5600	
R40	47Ω	½	D-7.101-250	BTS-47	
R41	470KΩ	½	D-7.101-129	BTS-470K	
R42	470KΩ	½	D-7.101-129	BTS-470K	
R43	100KΩ	½	D-7.101-101	BTS-100K	
R44	22KΩ	½	D-7.101-72	BTS-22K	
R45	15KΩ	½	D-7.101-69	BTS-15K	
R46	150Ω	½	D-7.101-248	BTS-150	
R47	5600Ω	½	D-7.101-46	BTS-5600	
R48	47Ω	½	D-7.101-129	BTS-470	
R49	470KΩ	½	D-7.101-128	BTS-470K	
R50	560KΩ 5%	½	D-7.101-133	BTS-560K	
R51A	10KΩ	½		BTS-10K	
B	250KΩ	½	†B-10.306	BTS-250K	
C	3.2Meg	½		BTS-3.2Meg	
R52	L. 1Meg	½	D-7.101-142	BTS-L.1Meg	
R53	330KΩ	½	D-7.101-121	BTS-330K	
R54	39KΩ	½	D-7.101-239	BTS-39K	
R55	470Ω	½	D-7.101-3	BTS-470	
R56A	22KΩ	½		BTS-22K	
B	2200Ω	½	♦B-10.101	BTS-2200	
C	8200Ω	½		BTS-8200	
R57	L. 1Meg	½	D-7.101-142	BTS-L.1Meg	
R58	150Ω	½	D-7.101-55	BTS-15K	
R59	2.2Meg	½	D-7.101-156	BTS-2.2Meg	
R60	2.2Meg	½	D-7.101-156	BTS-2.2Meg	
R61	5600Ω	½	D-7.103-118	BTS-5600	
R62	470Ω	½	D-7.101-3	BTS-470	
R63	470Ω	½	D-7.101-3	BTS-470	
R64	56Ω	½	D-7.101-6		
R65	56Ω	½	D-7.101-6		
R66	820KΩ	½	D-7.101-138	BTS-820K	
R67	3.3Meg	½	D-7.101-171		
R68	100KΩ	½	D-7.101-100		
R69	47KΩ	½	D-7.101-98		
R70	8200Ω	½	D-7.101-55		
R71	150KΩ	½	D-7.101-107	BTS-150K	
R72	180KΩ	½	D-7.101-111	BTS-180K	
R73	100KΩ	½	D-7.101-99	BTS-100K	
R74	8200Ω	½	D-7.101-55		
R75	470KΩ	½	D-7.101-126		
R76	1000Ω	½	D-7.101-17	BTS-1000	
R77	39KΩ 5%	½	D-7.101-76		Note 1
R78	470KΩ	½	D-7.101-129		
R79	33Ω	½	D-7.102-87		
R80	47KΩ	1	D-7.102-94		
R81	10KΩ	½	D-7.101-99		
R82	3.3Ω	1	C-6.213-7		
R83	7.5Ω	5	B-6.326-1		

Note 1. Some versions use a 27KΩ ½W resistor in this application.
† Items C44A, C44B, C44C, R51A, R51B, R51C are combined in one unit.
♦ Items C46A, C46B, C46C, R56A, R56B, R56C are combined in one unit.

TRANSFORMER (FILAMENT)

ITEM No.	RATING	REPLACEMENT DATA: MAJESTIC PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ②-.56A	6.3VAC ③ 5.3A	C-5.384				21F13 ①	

① Drill new mounting holes.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: MAJESTIC PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Osc. Trans.	C-9.230-5	B6702	A-3003	20VT1 ①	V405	A-8L26	26A03	A-97X
T3	Horiz. Output Trans.	D-9.225-1	F2411 * ①	HVO-2* ①	22GT4* ①	2030* ①	A-8L2P	F1T-24* ②	D-44*
T4	Vert. Output Trans.	D-9.228-8	21920 ②	A-3036		V308	A-8L2	26G51	A-90X ①
T5A	Yoke-Horiz. (23MZM)	D-9.223-1	DF604 ③	MDF-71 ③		Y70F35 ③	DY-15A ③	Y-18 ③	Y-19-1 ③
B	Vert. (37MH)								

① Drill new mounting hole(s).
② Use 11 to 1 turns ratio.
③ Use original horiz. yoke damping network.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
4	9	9	9	9	4	9	4
5 & 7	7	7	7	Jumper 5 & 7	Jumper 5 & 7	7	Jumper 5 & 7
6	N.C. See Note ③	N.C. See Note ③	N.C. See Note ④	N.C. See Note ③	6	N.C See Note ③	6
1	1	1	1	1	1	1	1
Special Notes →	③	③	③	③	③	③	③

③ To reduce horiz. yoke "ringing", connect R51 in series with C66 across terms #3 & #7 of horiz. yoke.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: MAJESTIC PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T6	2.1KΩ	3.2Ω	C-9.365-1	21005					

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: MAJESTIC PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	4"	PM	3.2Ω	C-30.322-3-B C-30.447 ①	4A1	① Alternate 4" PM speaker

COILS (RF-IF)

ITEM No.	USE	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: MAJESTIC PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coils	00CT	0Ω					
L2	FIL. Choke	0Ω						
L3	RF, Mixer Grid, Osc. Coils	0Ω						
L4	FIL. Choke	0Ω						
L5	RF Coil	0Ω						
L6	1st Video IF	1Ω						
L7	2nd Video IF	.5Ω	.7Ω	C-1.553	17-1063	TV-116	6349	
L8	3rd Video IF	.3Ω	.3Ω	C-1.553	17-1066	TV-116	6349	
L9	4th Video IF	.5Ω	.5Ω	C-1.553	17-1063	TV-116	6349	
L10	Series Peaking Coil	7.3Ω		C-1.533-4	19-2135		6189	120 Microhenries
L11A	4.5MC Trap	2.1Ω		C-1.709				
B	1st Sound IF	2.1Ω						
L12	Shunt Peaking Coil	16Ω		C-1.533-5	19-6400		6134	388 Microhenries
L13	Series Peaking Coil	7.5Ω		C-1.533-3	19-2133		6133	114 Microhenries
L14	2nd Sound IF	2Ω	2Ω	C-1.553	17-1065	TV-115	6303	
L15	Quadrature Coil	3.7Ω		C-1.710	17-2499*	TV-118*	1488	
L16	Horiz. Osc.	37Ω	90Ω	C-1.549	20-1402	TV-162	6183	Waveform Winding-36Ω

* Use one winding only.

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D. C. RESISTANCE	RATINGS: INDUCTANCE @ CURRENT 1000 ~	REPLACEMENT DATA: MAJESTIC PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L17	210ADC	85Ω	1.84H	C-5.38-1	C5037 ①	C-2966 ①	C-2326 ①	26C44	C-23X

① Drill one new mounting hole.

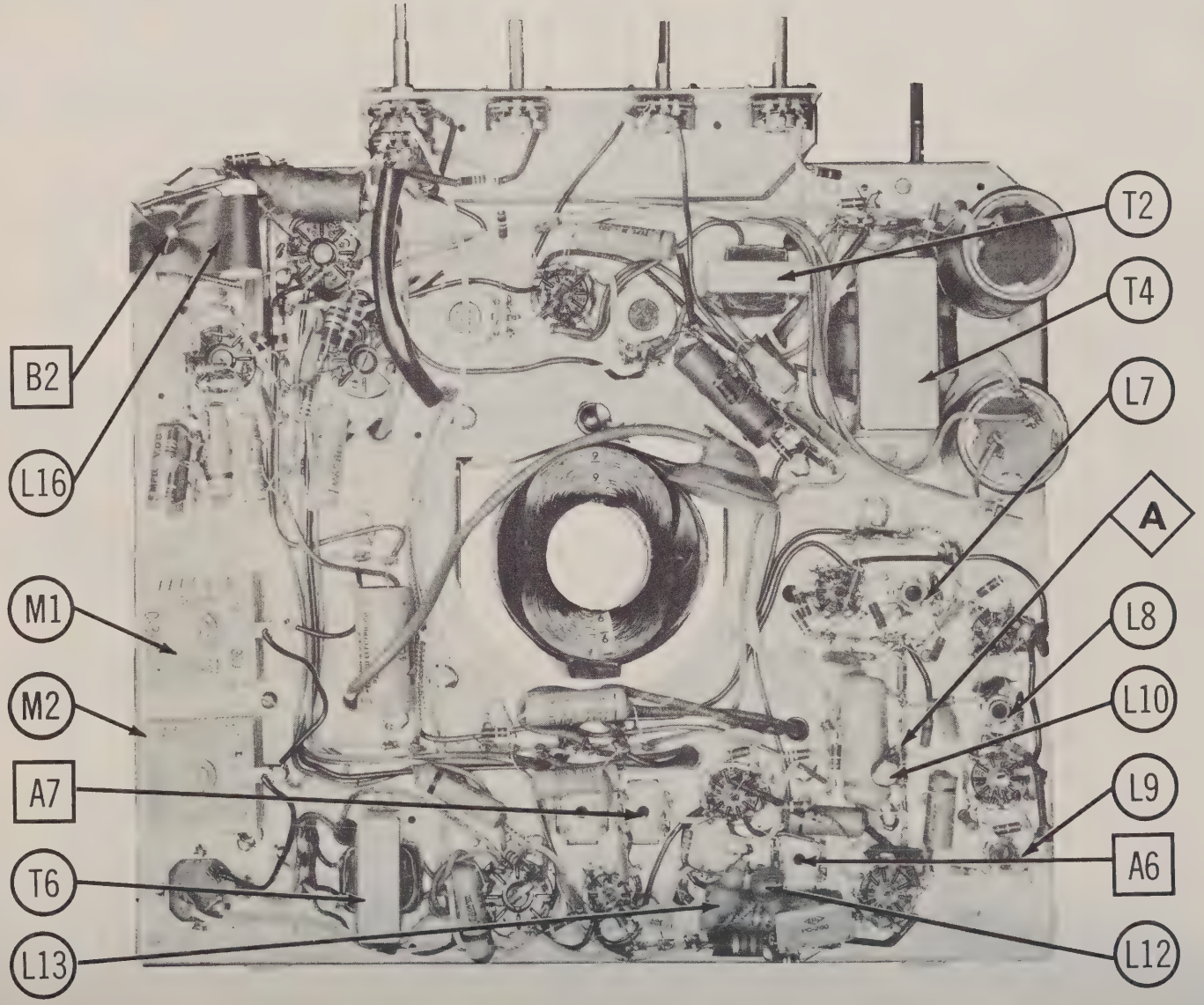
SELENIUM RECTIFIER

ITEM No.	RATING: CURRENT	REPLACEMENT DATA: MAJESTIC PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.210ADC	C-38.307	1090A	MR300	8S300	6Q4	300	
M2	.210ADC	C-38.307	1090A	MH300	6S300	6Q4	300	

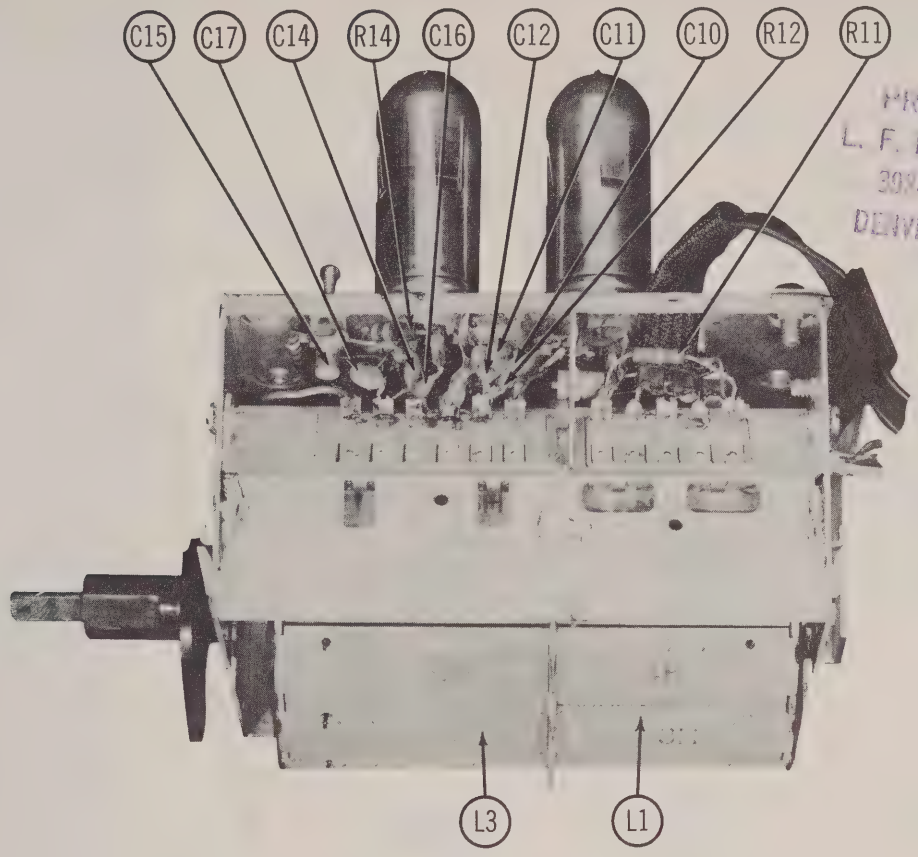
MISCELLANEOUS

ITEM No.	PART NAME	MAJESTIC PART No.	NOTES
M3	Tuner	B-38.278-1	VHF
M4	Focus Magnet	D-46.108	Includes centering device
M5	Ion Trap	36.144-3	
	Cabinet	E-13.706-1	Model 40
	Cabinet	E-13.707-1	Model 52
	Cabinet	E-13.708-1	Model 50
	Knob	C-13.403-1	Channel Selector
	Knob	C-13.409-1	Fine tuning
	Knob	B-13.404-1	Contrast, vert. hold, horizontal hold
	Knob	B-13.408-1	On-off-volume
	Knob	B-13.406-1	Brightness
	Safety Glass	D-38.795-1	Model 40
	Safety Glass	D-38.795-2	Models 50, 52
	Mask	C-14.371	Model 40
	Mask	C-14.374	Models 50, 52

MAJESTIC MODELS 40 (Series 125), 50, 52 (Series 126)

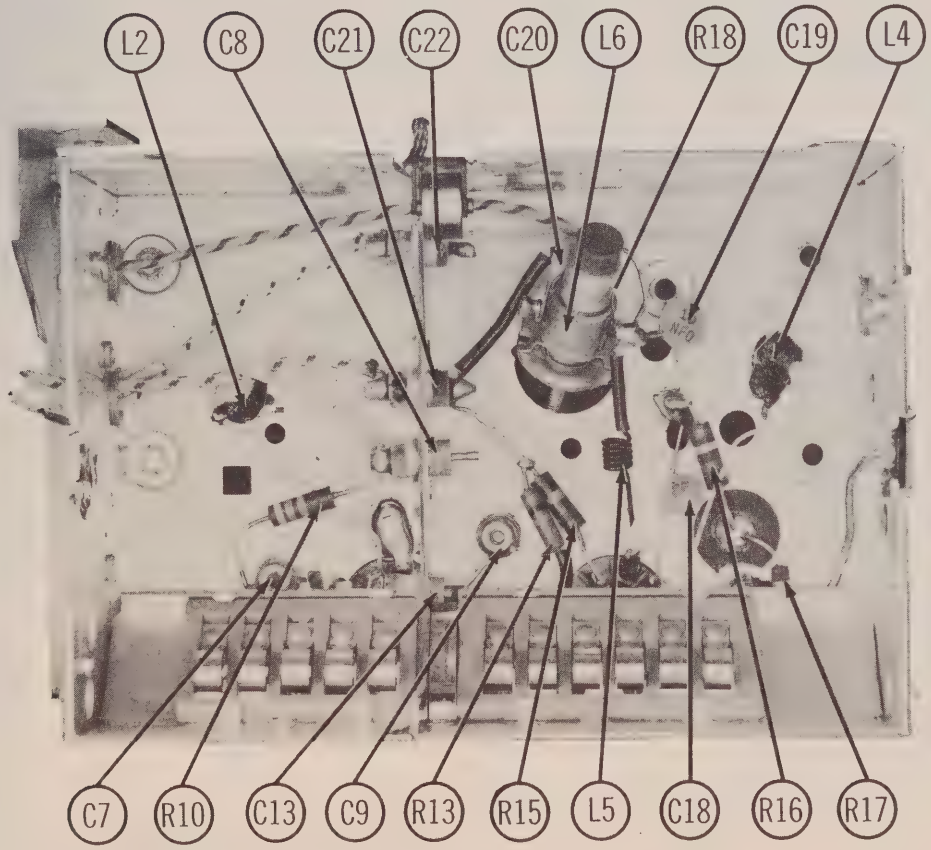


CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

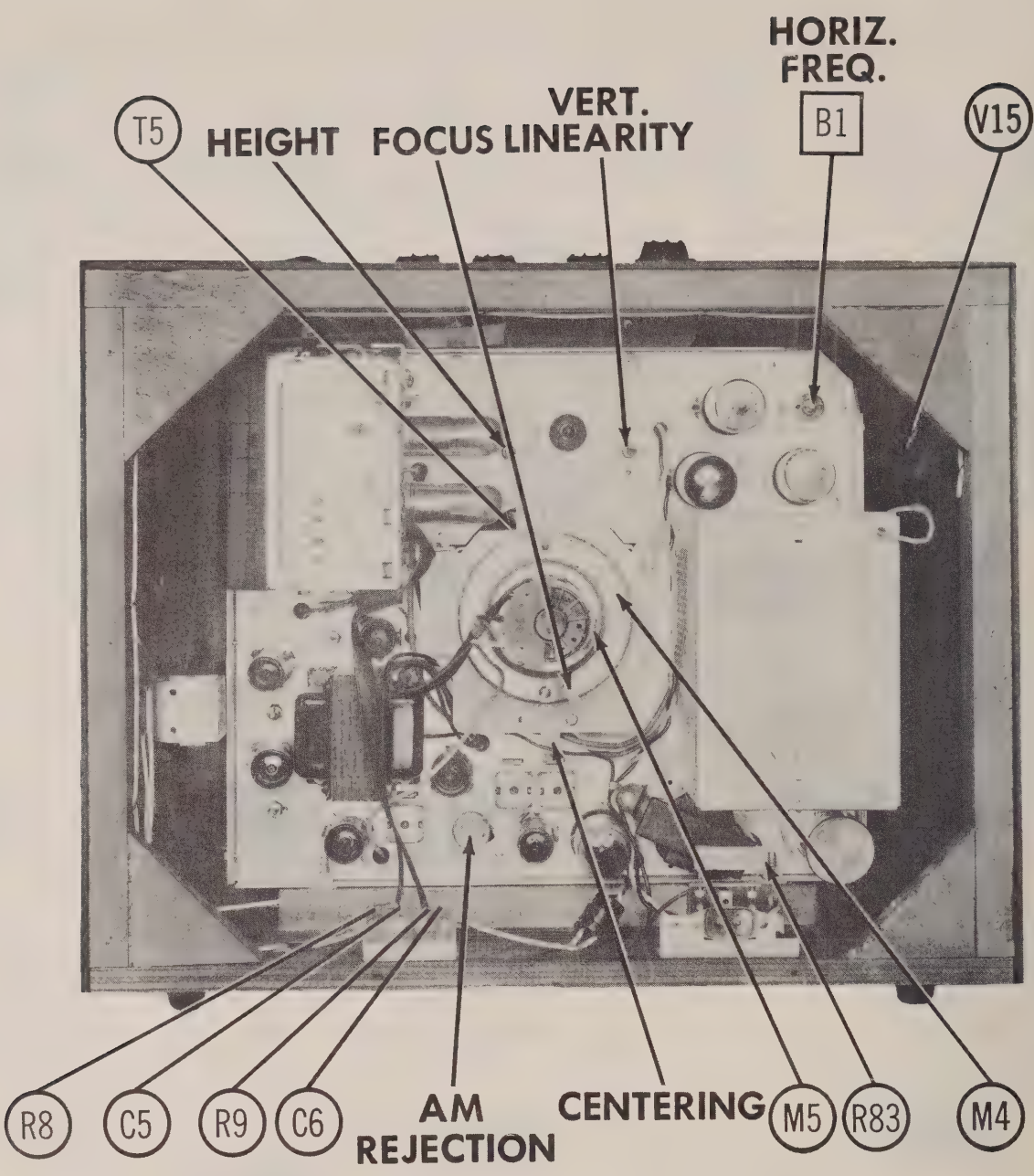


PROPERTY OF
L. F. BLANKENSHIP
3984 MERIDE ST.
DENVER, COLORADO

RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern. Turn the contrast control at its mid-position. Turn the horizontal hold control fully counter clockwise.

If the picture is out of sync, adjust the horizontal frequency slug (B1) until the picture synchronizes. Momentarily interrupt the signal by switching off channel, then back again. The picture should just fall out of sync. If it does not, turn B1 slightly clockwise, and again interrupt the signal. Continue this procedure until the picture just falls out of sync only when signal is interrupted. Rotate the horizontal hold control clockwise until picture falls into sync. The picture should remain in sync throughout most of the range of the horizontal hold control. If the picture does not hold syne it may be necessary to adjust the horizontal waveform slug (B2). Connect the vertical amplifier of an oscilloscope thru a 10KΩ to terminal "C" of the horizontal oscillator coil (L16). Connect the low side to chassis. If necessary, adjust B2 to obtain waveform similar to Fig. 5.

During adjustment of B2 keep picture in sync by adjusting B1.

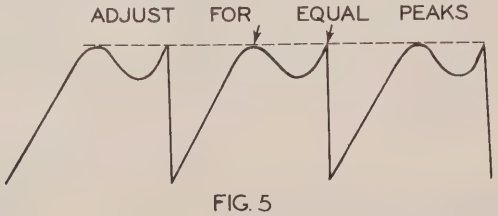


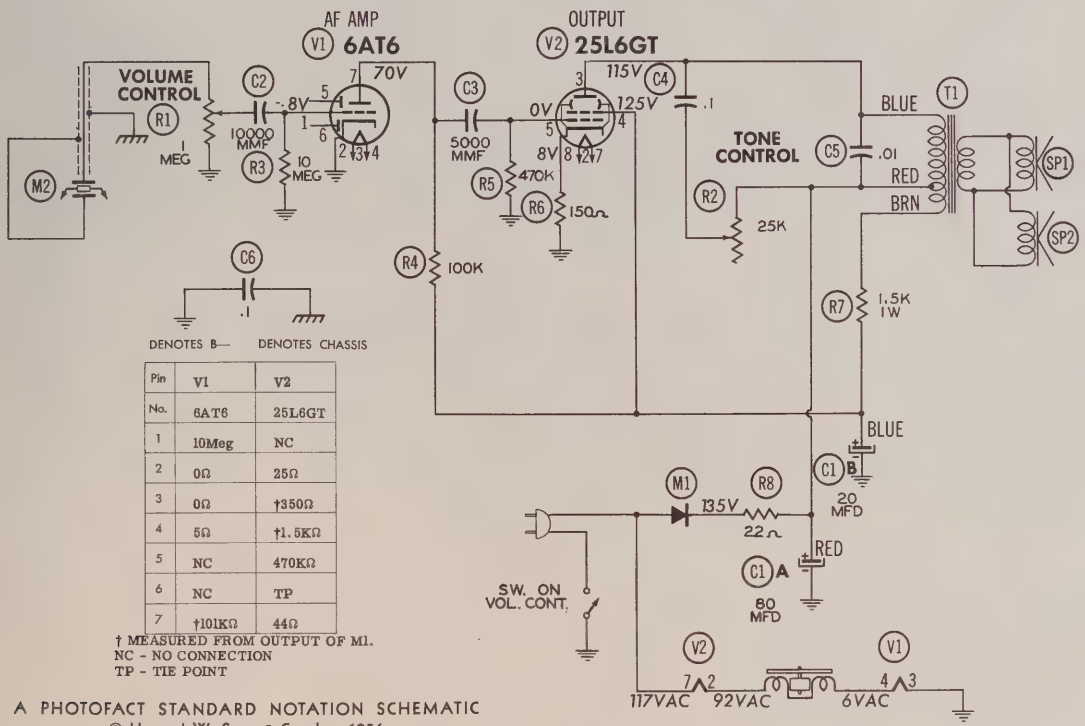
FIG. 5

RCA VICTOR MODELS 6-EMP-1A, B (Ch. RS-152)

RCA VICTOR MODELS 6-EMP-1A, B (Ch. RS-152)

PROPERTY OF
L. I. CLASSIFIED
3914 MAIN ST.
DENVER, COLORADO

TRADE NAME	RCA Victor Models 6-EMP-1A, 6-EMP-1B (Ch. RS-152)
MANUFACTURER	RCA Victor, Radio & "Victrola" Div., Radio Corp. of America, Camden 2, N.J.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Manual Record Player
TUBES (Two)	Types: 6AT6 AF Amp., 25L6GT Output
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING .36 Amp. @ 117 Volts AC



Pin No.	V1 6AT6	V2 25L6GT
1	10Meg	NC
2	0Ω	25Ω
3	0Ω	†350Ω
4	5Ω	†1.5KΩ
5	NC	470KΩ
6	NC	TP
7	†101KΩ	44Ω

† MEASURED FROM OUTPUT OF M1.
NC - NO CONNECTION
TP - TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		RCA Victor PART No.	STANDARD REPLACEMENT		
V1	AF Amplifier	6AT6	6AT6	7BT	
V2	Output	25L6GT	25L6GT	7AC	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	RCA Victor PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	80	150	100269	TCT3116	TDL-8030-150	FMT-315	Red
B	20	150					Yellow

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	RCA Victor PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	
C2	10000		73960	DD-103	811-01	DC-511	
C3	5000		98068	DD-502	811-005	DC-525	
C4	.1	200	73784	DF-104		PT401	
C5	.01	400	73561	D6-103	GP3-333-103	PT411	
C6	.1	400	73551	DF-104		PT401	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	100267	B-70-S	A47-1Meg-Z	Q13-137	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	Not Req.	SWE-12	76-1	US-26	Attach to R1A
R2A	25KΩ	½	100268	AB-26	A47-25K-S	Q11-120	U-29	Tone
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R2A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA Victor PART No.	IRC PART No.	
R3	10Meg	½	503610	BTS-10Meg	
R4	100KΩ	½	503410	BTS-100K	
R5	470KΩ	½	503447	BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA Victor PART No.	IRC PART No.	
R6	150Ω	½	503115	BTS-150	
R7	1500Ω	1	512215	BTA-1500	
R8	22Ω	½	503022	BTS-22	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.8KΩ	1.75Ω	100272				24S50A①		① Drill one new mounting hole.

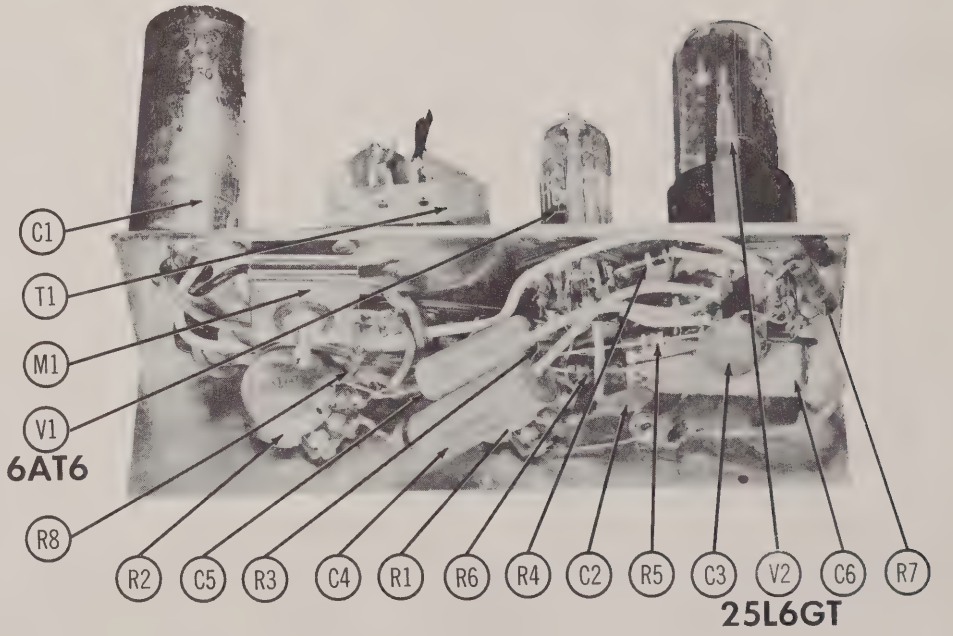
SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	RCA Victor PART No.	QUAM PART No.	
SP1	4"	PM	3.5Ω	79696	4A07	
SP2	4"	PM	3.5Ω	79696	4A07	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	RCA Victor PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.054ADC	100271	1263A	RS065	6S65	8J1	65	

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	RCA Victor PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2	100329	55-TJ *P-55T	GD-J	47 *2447	0-1 or S-1 & 0-3	* Complete tone arm and cartridge assembly

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	RCA Victor PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M3	100330	*A-72 or †A-71 or ♦†A-71SD or ♦A-71D		† W-8TPS	* Metal † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
	Knob	100264	On-off-volume & tone - Model 6EMP1A
	Knob	100265	On-off-volume & tone - Model 6EMP1B
	Knob	100322	Speed Control

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PROPERTY OF
L. F. BLANKENSHIP
2020 MEADE ST.
DENVER, COLORADO

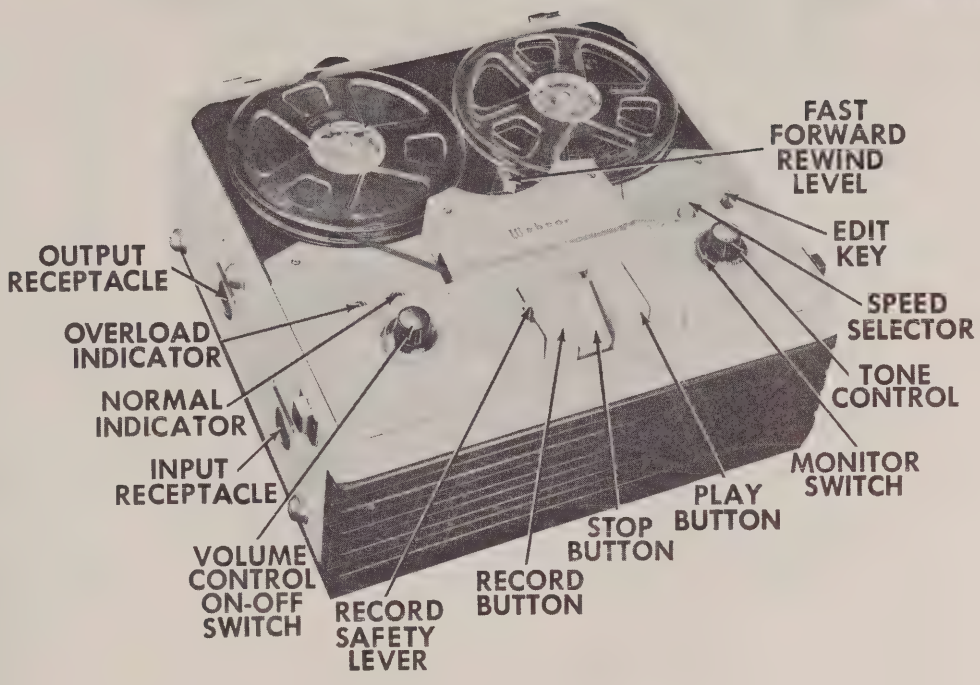

Figure 1

GENERAL INFORMATION

The Webcor 2020 Series Tape Recorders are designed for twin-track, two speed operation. The operating speeds are either 3 3/4 or 7 1/2 inches per second. The Webcor is designed to record and playback two tracks of material on standard width recording tape, which doubles the recording and playing time with no loss of frequency response or quality. Recordings can be made from a radio, television receiver, or phonograph, in addition to those made directly from the microphone.

The Webcor 2020 Series are mechanically and electrically alike. The only difference being in the cabinet, or carrying case used. The portable model of this series, 2020, is available in Ebony (E-2020) or in Tan (T-2020). The table models are available in Walnut (2021), Mahogany (2022), Blonde (2023) or Beige (2024).

Webcor 2020 Series have two tape speeds, 7 1/2" and 3 3/4" per second. Using both tracks, the recording times are as follows:

Size Reel	Speed	Speed
	3-3/4"	7-1/2"
5"	1 hour	1/2 hour
7"	2 hours	1 hour

The 2020 Series are designed to operate on 60 cycle, 105-120 volts, AC supply only.

Manufactured by:

Webcor
5610 Bloomingdale Ave.
Chicago 39, Illinois

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WEBCOR MODELS E-2020, T-2020, 2021, 2022, 2023, 2024

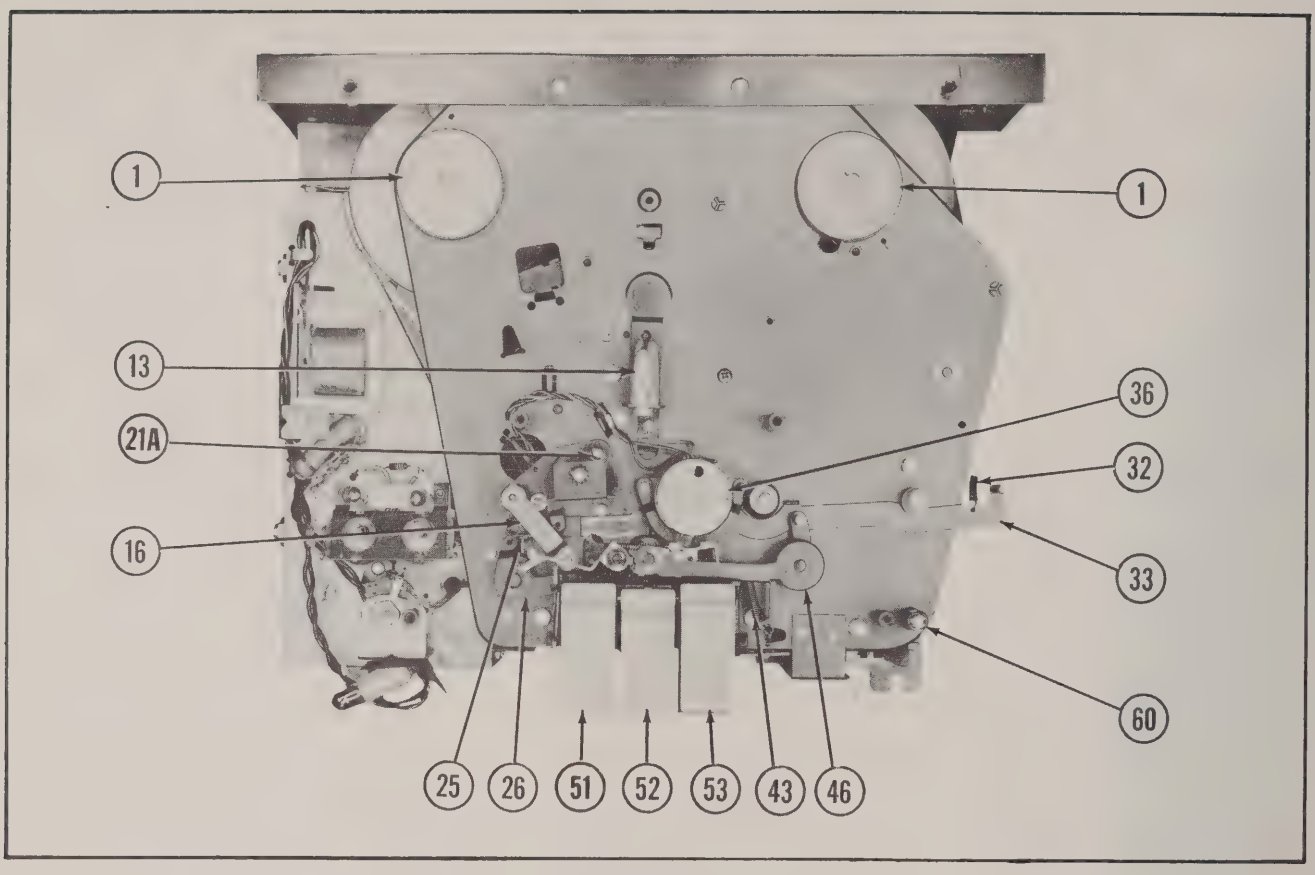

Figure 2

FUNCTIONS OF THE CONTROLS

On-Off-Volume Control-

1. Turning this control clockwise a quarter of a turn you apply operating voltage to the recorder.

2. The tube filaments and the pilot indicator lamp should light.

3. Additional clockwise rotation will increase the signal strength.

Tone-Monitor Control-

1. The top knob is the tone control. Turning it clockwise accentuates bass during playback only.

2. The bottom knob is the monitor switch. Turning the knob clockwise turns the monitor on during recording. Turning the knob counterclockwise disconnects the monitor during recording.

Record Button-

1. Release the safety lock lever (54) before pressing "Record Button".

2. Pressing the "Record Button" (51) actuates pressure roller (46) against capstan shaft (12).

3. Relieves brake drag (148).

4. Brings erase magnet and its pressure pad (28) against opposite sides of the tape.

5. Locks rewind lever (13) in the center position.

Play Button-

1. Pressing "Play Button" causes the same action described in items 1 through 5 under "Record Button".

2. The erase magnet pressure pad engages the tape, the erase magnet is not brought into contact with the tape.

3. Switching action occurs which feeds the signal picked up by the recording head through a series of amplifiers.

Stop Button-

1. Pressing the "Stop Button" releases the pressure roller.

2. Releases the recording head pads from their position against the recording head.

3. Releases the motor bushing from its position against the capstan rim.

4. Releases the erase magnet and its pressure pad from against the capstan rim.

Speed Selector-

1. Pressing down on this button raises the capstan shaft to engage the roller for 7 1/2 I. P. S. operation.

2. Turning the button slightly to the left and permitting it to rise, will lower the capstan shaft to engage the pressure roller for 3-3/4 I. P. S. operation.

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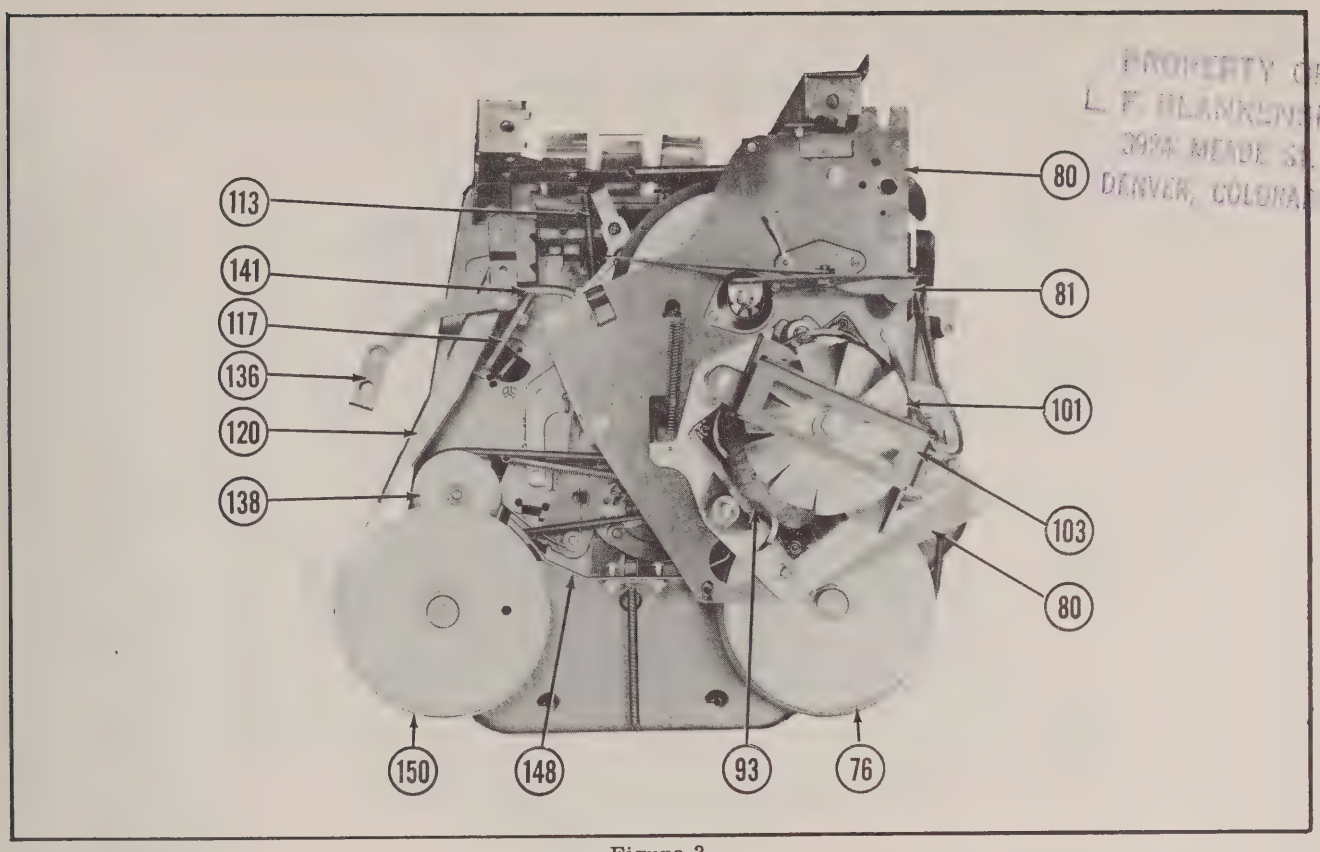

Figure 3

Edit Key-

1. Pulling forward on this lever will release the pressure roller from the capstan shaft.

2. The motor is not disengaged from the capstan shaft when the edit key is actuated nor does any electrical switching take place.

Fast-Rewind-Forward Lever-

1. When the stop button is depressed, the fast "Rewind-Forward" lever may be moved from its position, either to the left or right.

2. When the lever is moved to the right the belt engages the drum of the take up reel causing an approximate 20-1 ratio transport.

3. Moving the lever to the left causes a similar action on the supply reel.

OPERATING INSTRUCTIONS

Preparing The Webcor For Recording-

1. Plug the AC cord into a convenient wall receptacle of the proper rating.

2. Place the reel containing the tape on the left or supply spindle.

3. Place an empty reel on the right or "take-up" spindle.

4. Unwind about 12 to 15 inches of tape and guide it into the tape slot. (Be sure the shiny side of the tape faces the front of the cabinet).

5. Take the end of the tape and wrap it around the hub of the empty reel. Bring the end of the tape through one of the slots on the reel hub and revolve the reel several times.

To Make A Recording-

1. After the recording tape has been properly threaded, turn the "On-Off" switch and "Volume Control" to the "On" position.

2. Press the "Speed Selector" knob (9) down for 7-1/2 I. P. S. operation or turn slightly to the left and permit the button to raise for 3-3/4 I. P. S.

3. To record, pull the "Record Safety Lever" (54) downward, and at the same time push down firmly on the "Record" button.

4. Adjust the "Volume" control so that the "Overload Indicator" barely lights on the recording peaks and so that the "Normal Indicator" blinks constantly during recording.

To Record From Microphone-

1. Insert the microphone plug into the "Input Receptacle" located on the left side panel.

2. Follow the instructions under the heading of "To Make A Recording".

3. Best results will be obtained if the microphone is kept closer to the source of sound than to any walls in the recording area to prevent echos of the sounds as they rebound off the walls.

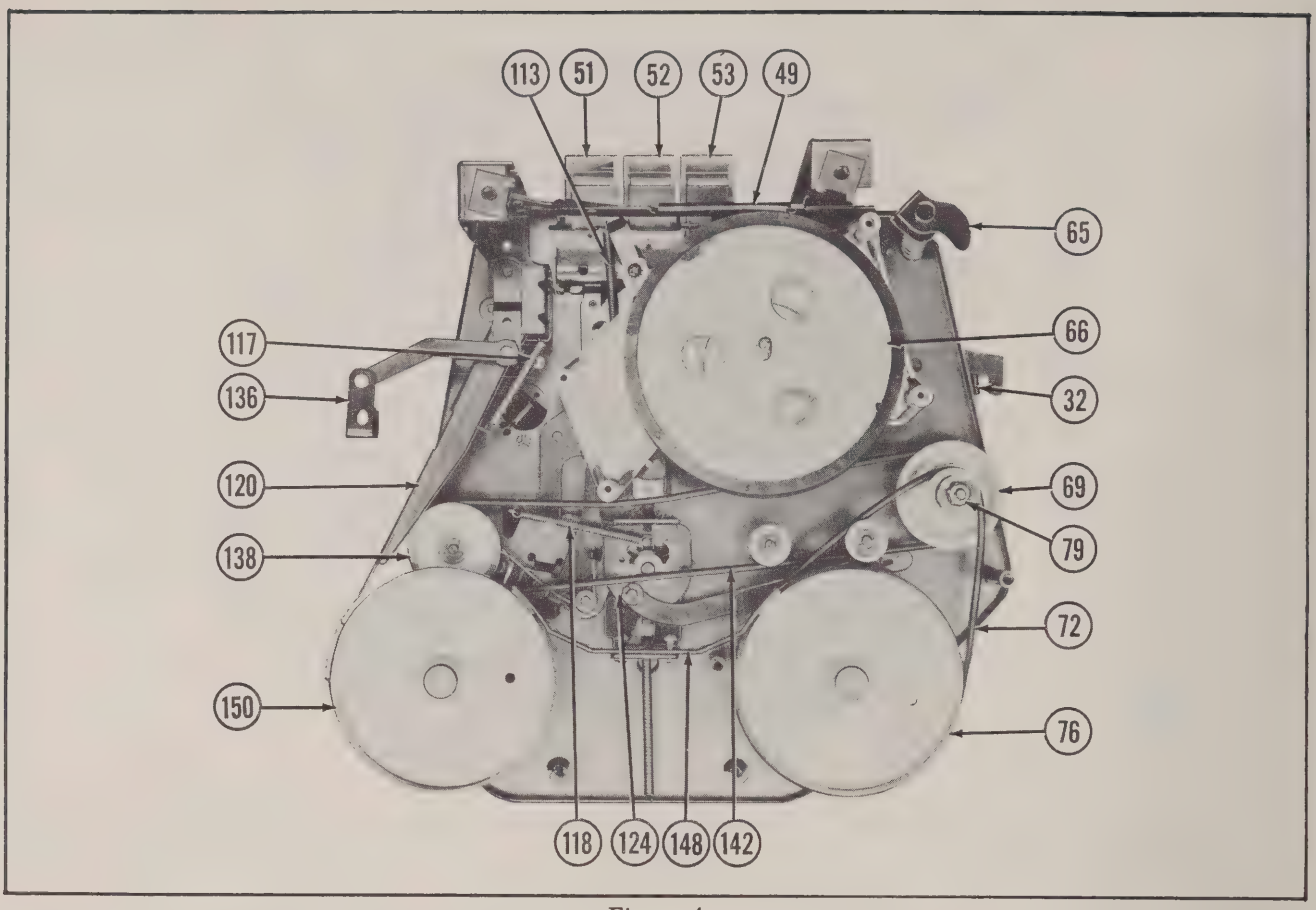

Figure 4

NOTE: The microphone should be kept at least three feet away from the loudspeaker during recording.

To Record From Radio Or Television Receiver-

Recordings can be made from a radio or television receiver by placing the microphone near the loudspeaker; however, this type of recording may not be satisfactory as other sounds may be recorded on the tape. A superior quality recording can be made by use of Radio Cord Attachment (part No. 2927). Connect attachment cord as follows:

1. Connect the cord clips across the voice coil terminals on the radio or television speaker.

2. Insert the cord plug into the "Input Receptacle" located on the left side panel of the recorder.

3. Set the radio or television receiver for soft playing then operate the Webcor controls as described under "To Make A Recording".

To Record From Phonograph-

1. Connect the alligator clips of the Radio Cord Attachment to the ends of the pickup leads of the phonograph and then insert the cord plug into the "Input Receptacle". Proceed with the recording as described under "To Make A Recording".

NOTE: Should a hum develop from the above connections, reverse the cord clips on the pickup leads.

To Rewind-

When the stop button is depressed, the "Fast-Rewind-Forward" lever (13) may be moved from its center position. To "Rewind" move the lever to the left. When the rewinding is completed move the mechanism control knob (52) into "Stop" position and allow the tape to come to a complete stop before moving the mechanism control knob to any other function.

Twin Track Operation-

Webcor 2020 Series are twin-track units, which record on approximately half the width of the tape at one time.

1. To record a second program on the same tape, lift the full reel from the right hand spindle, turn it over, and place it on the left hand spindle.

2. Place the empty reel on the right hand spindle; properly thread the tape, and continue your recording as described under "To Make A Recording".

NOTE: Since it is impossible to edit and splice one track without affecting the other, recordings which are to be edited should be limited to one track only.

To Play A Recording-

1. With the tape properly threaded, turn the mechanism control knob (51) to the "Play" position.

2. Adjust the "Volume" and "Tone" controls to suit.

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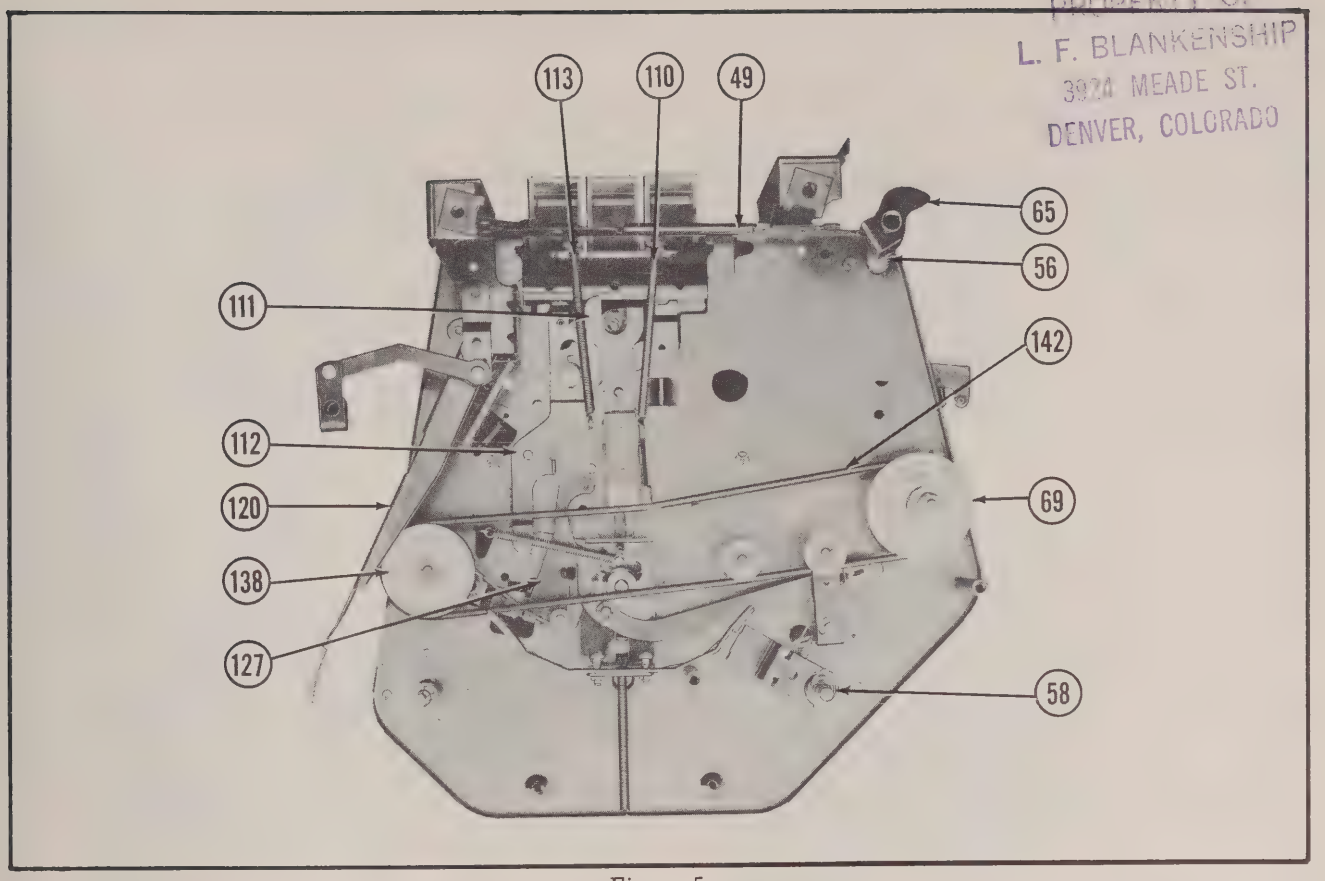

Figure 5

3. Be sure the "Speed Selector", located on the right side of the top panel, is in the speed that the recording was made.

Fast Forward-

If it is desired to reach a recording near the end of a tape in a few seconds, turn mechanism control knob (13) to the "Fast-Forward" position. For the "Fast-Forward" position the control should be turned to the right. When the lever is moved to the right you have approximately 20-1 ratio transport.

ADJUSTMENTS

Clutch Adjustments-

The nut (79) permits adjustment of the corresponding clutch assembly. It should be adjusted so that the take up reel absorbs the slack tape during the record and play operations. The clutch pad (70) is 10% oil saturated to permit a smooth take up and slipping action when constant tension of the tape is attained. Excessive tension may cause waver and tape squeal. Insufficient tension may cause tape looping ahead of the take-up reel, and a jerking action.

Erase Adjustment-

1. Insert a reel of recorded tape and press the "Record" button.

2. Check to see if the surface of the tape makes good contact with the surface of the shoe face. If it does not, adjust screw (21A).

3. Check to see that the top of the tape is exactly positioned at the top of the scribed diagonal line on the shoe face. If it is not, adjust the threaded tape guide (15) and the locking nut (14).

4. Turn the recorder "On".

5. Turn the volume control to minimum (full counterclockwise).

6. Play the reel of tape through with the recorder in the "Record" position.

7. Press the "Stop" button and rewind the tape.

8. Turn the volume control to maximum (full clockwise).

9. Set the recorder to the "Play" position. If the adjustments are correct, nothing should be heard as the tape is played back. No audio output indicates proper erase.

Play/Record Head Adjustment-

It is very important that play-record head (36) be lined up perfectly with the tape. If it is not, low output, loss of high frequencies or track overlap may result.

IMPORTANT: The head has been aligned and locked in place at time of manufacture and should require no further adjustment, unless it becomes necessary to install a new head.

To adjust, make a tape recording of a 6000 cycle signal on a good unit. Place this on the unit that the head is to be aligned on. Connect an output meter or AC voltmeter across the speaker voice coil. Play the 6000

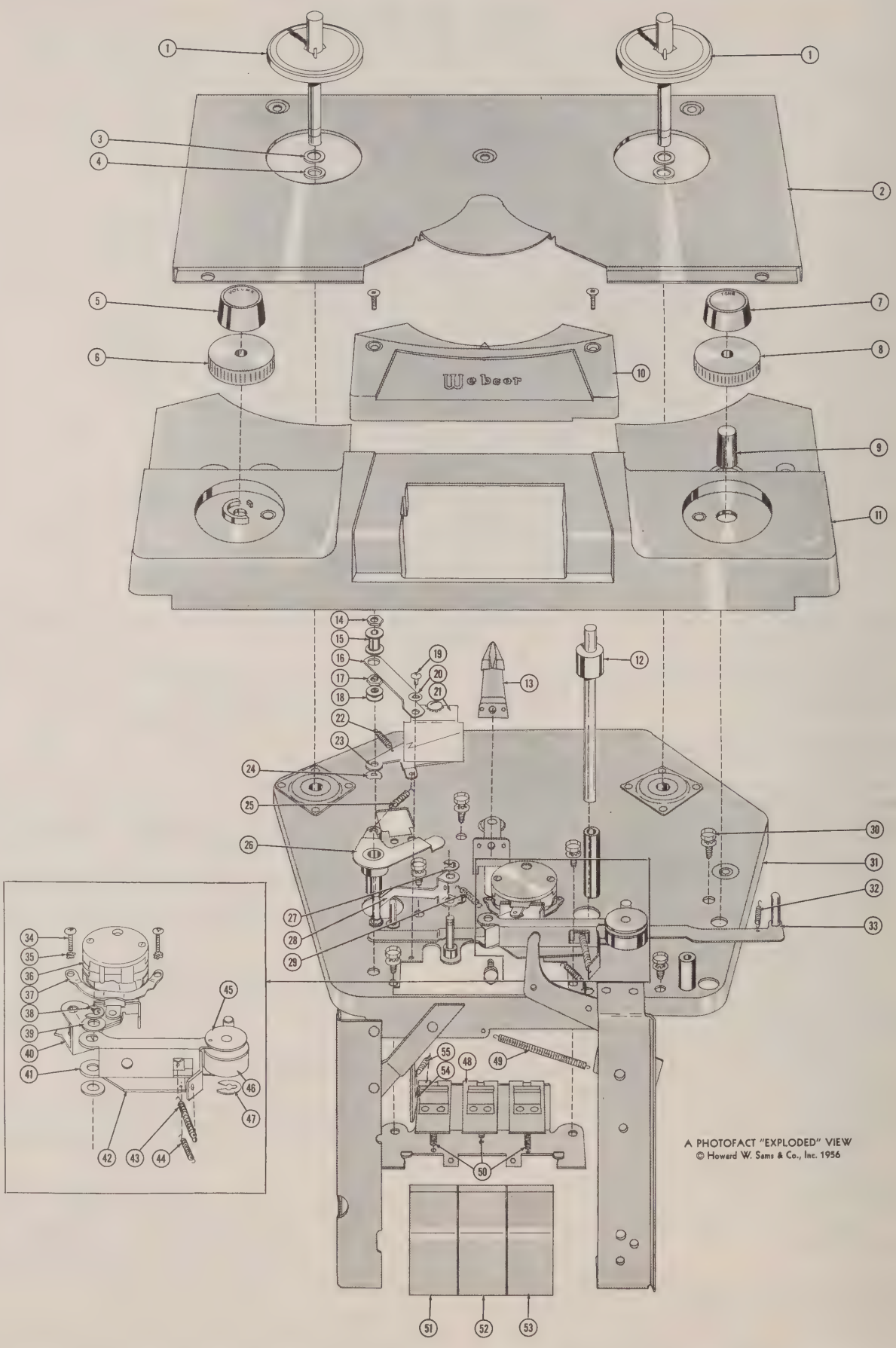

Figure 6A Exploded View of Parts Above Baseplate

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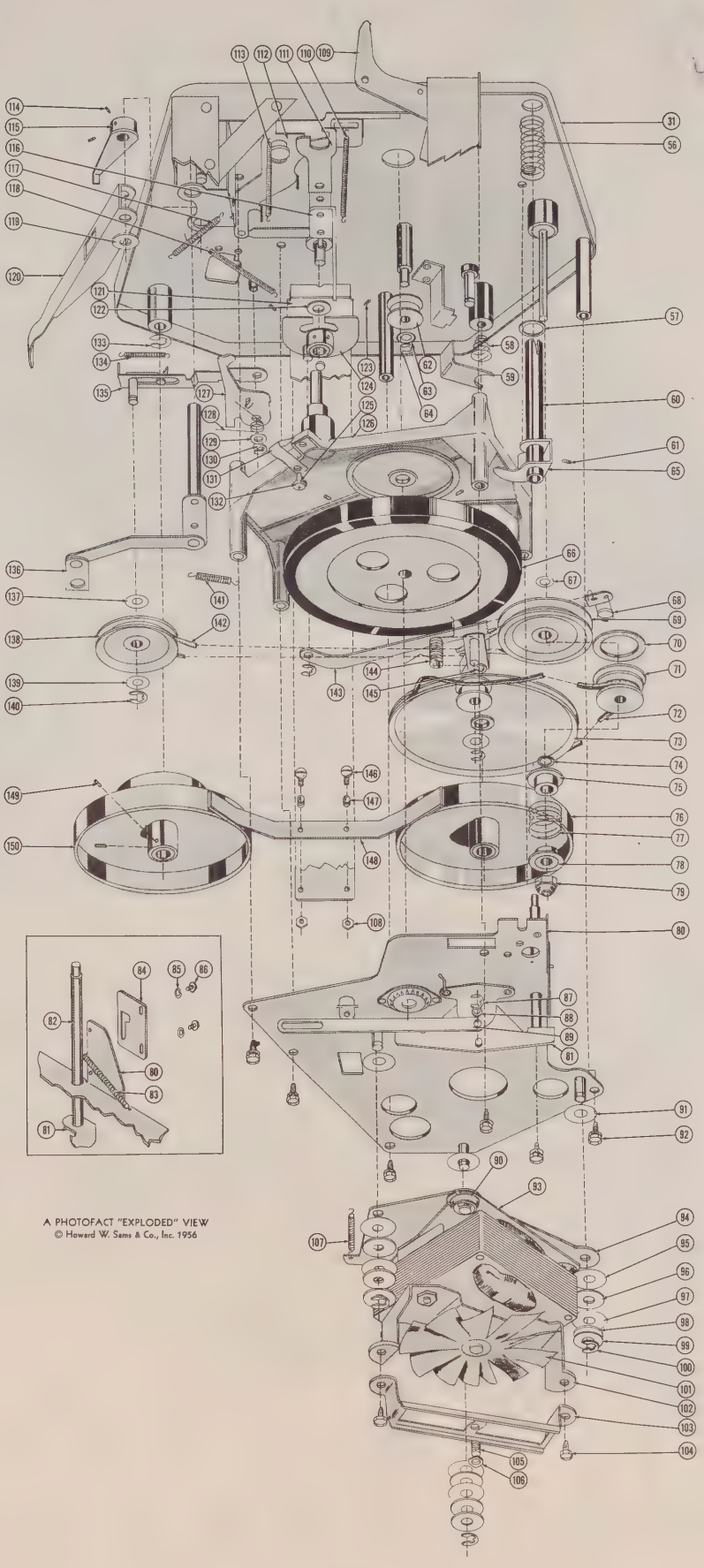


Figure 6B Exploded View of Parts Below Baseplate

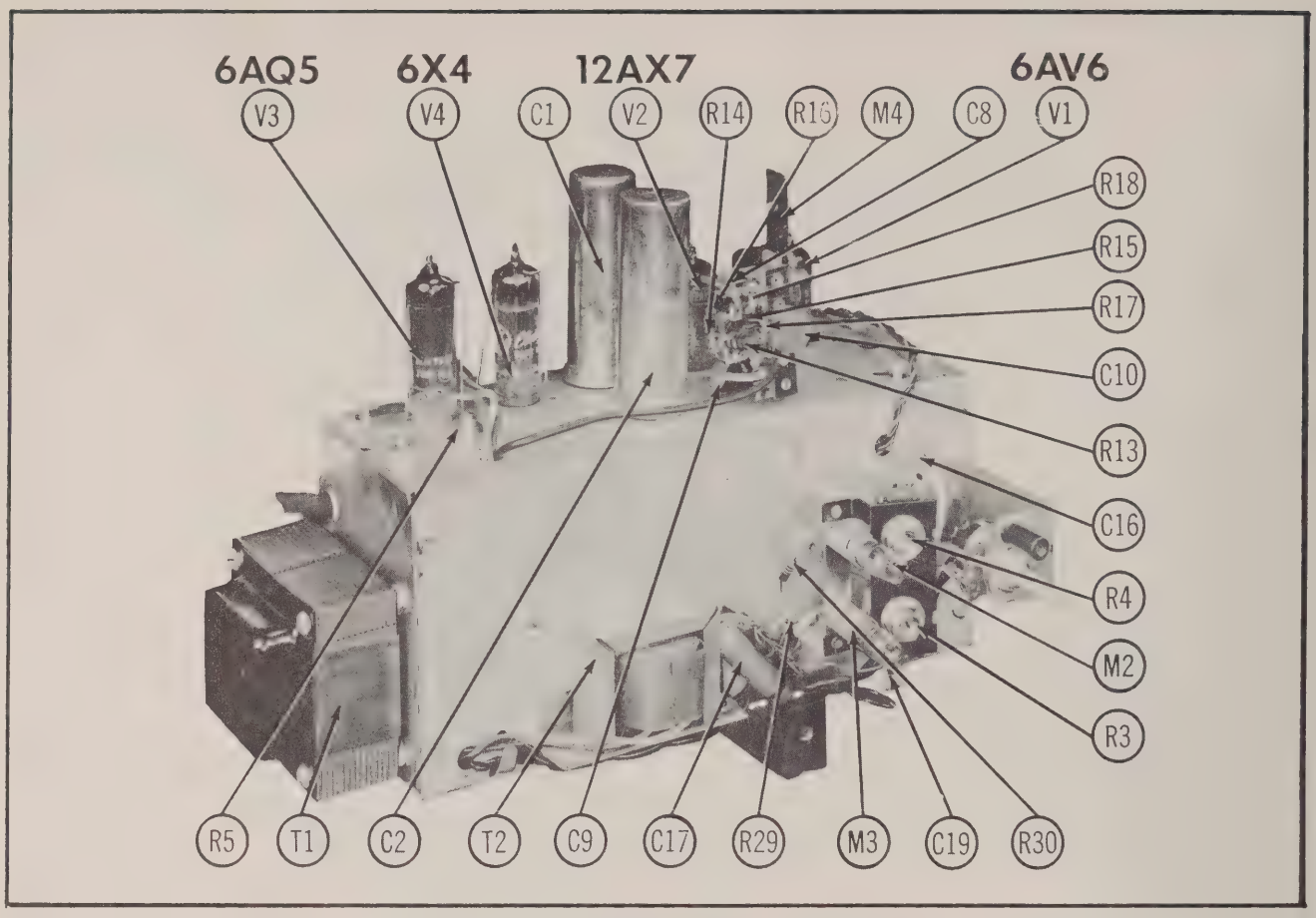


Figure 7

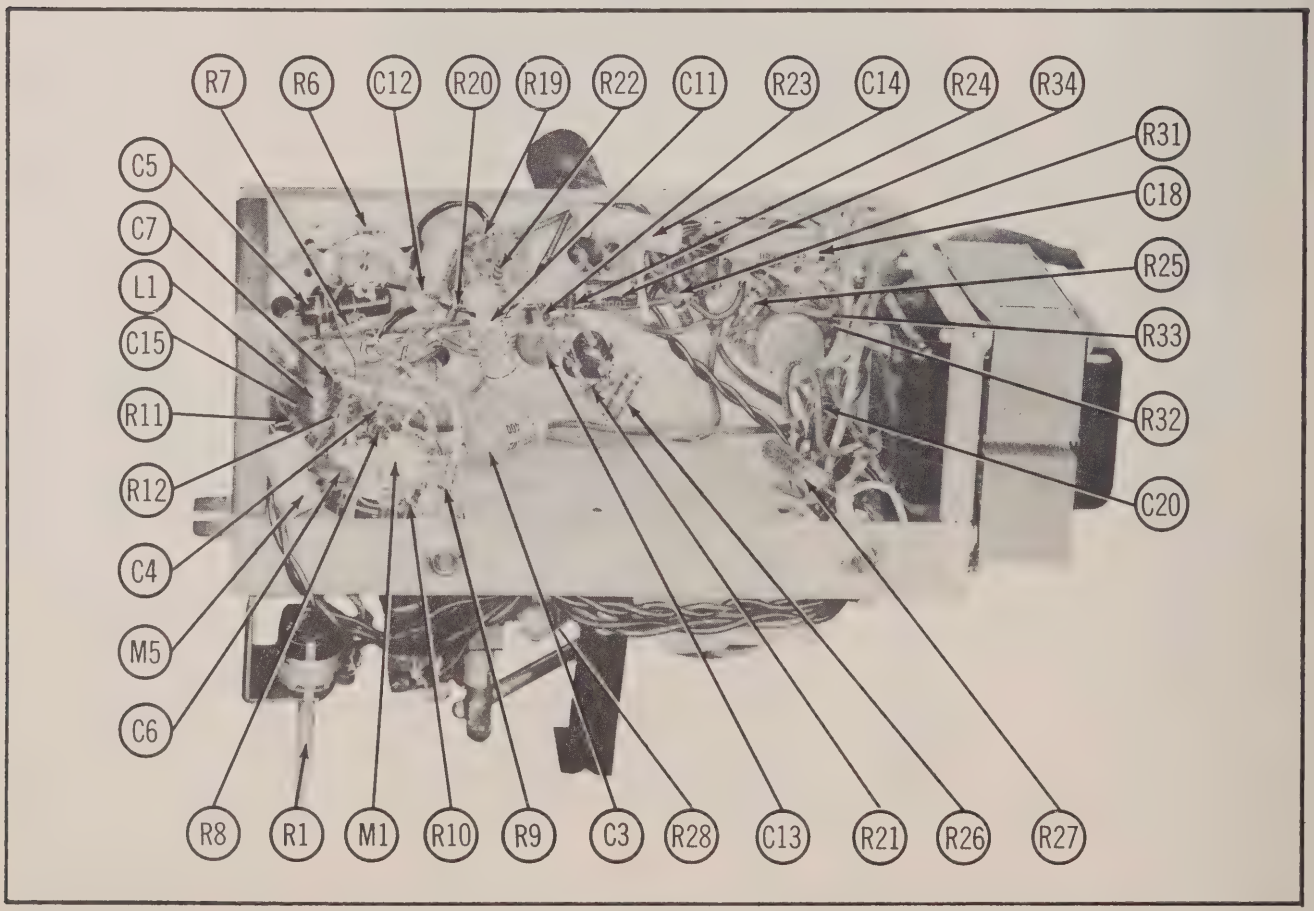
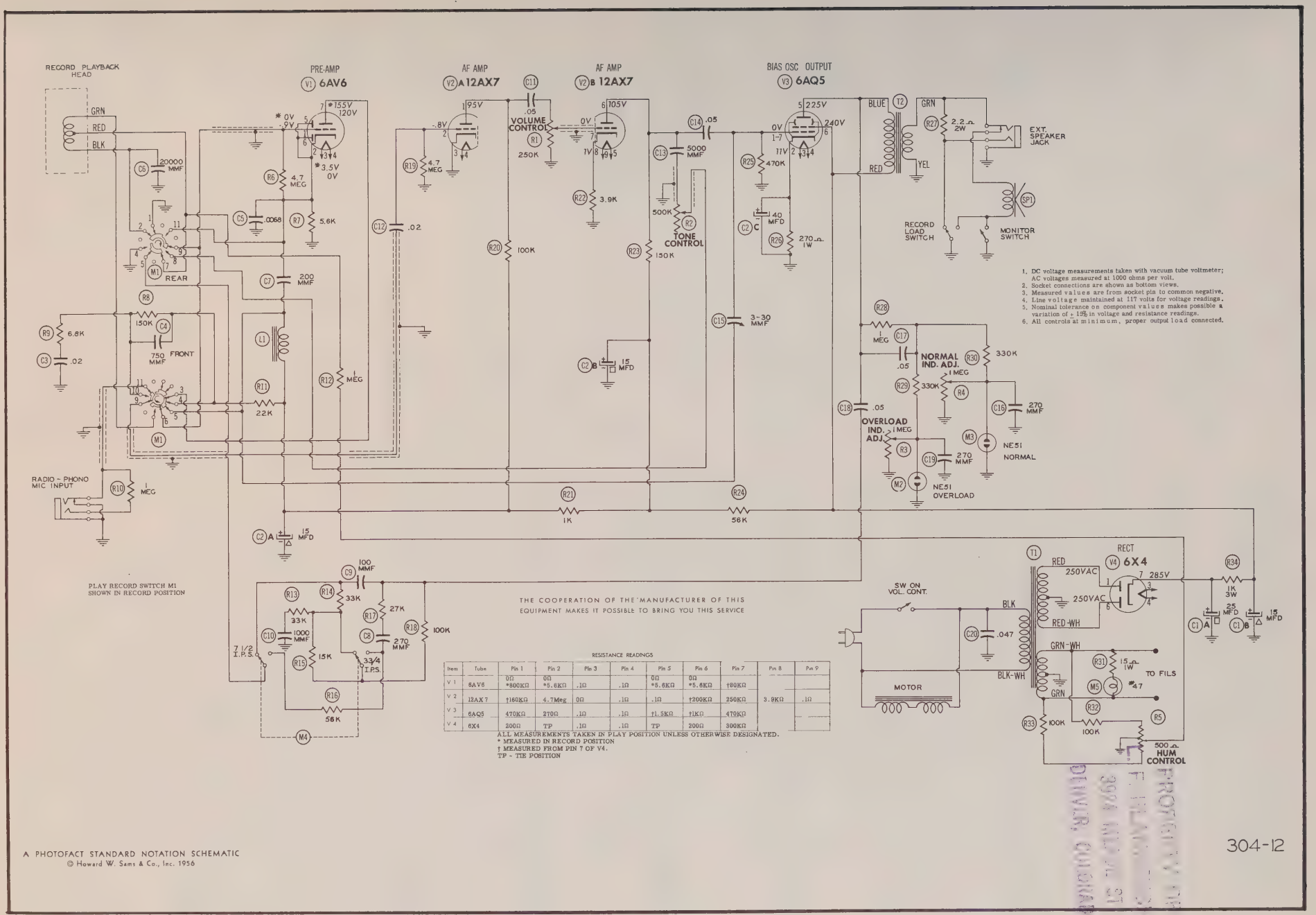


Figure 8


RECORD PLAYBACK HEAD
GRN
RED
BLK
PRE-AMP
V1 6AV6
AF AMP
V2A 12AX7
AF AMP
V2B 12AX7
BIAS OSC OUTPUT
V3 6AQ5
VOLUME CONTROL
TONE CONTROL
RECORD LOAD SWITCH
MONITOR SWITCH
EXT. SPEAKER JACK
REAR
FRONT
RADIO - PHONO MIC INPUT
NORMAL IND. ADJ.
OVERLOAD IND. ADJ.
NE51 NORMAL
NE51 OVERLOAD
RECT V4 6X4
SW ON VOL. CONT.
MOTOR
TO FILS
HUM CONTROL
7 1/2 I.P.S.
3 3/4 I.P.S.
PLAY RECORD SWITCH M1 SHOWN IN RECORD POSITION
THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
RESISTANCE READINGS
ALL MEASUREMENTS TAKEN IN PLAY POSITION UNLESS OTHERWISE DESIGNATED.
* MEASURED IN RECORD POSITION
† MEASURED FROM PIN 7 OF V4.
TP - TIE POSITION
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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304-12

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AV6	0Ω *800KΩ	0Ω *5.6KΩ	.1Ω	.1Ω	0Ω *5.6KΩ	0Ω *5.6KΩ	†80KΩ		
V 2	12AX7	†160KΩ	4.7Meg	0Ω	.1Ω	.1Ω	†200KΩ	250KΩ	3.9KΩ	.1Ω
V 3	6AQ5	470KΩ	270Ω	.1Ω	.1Ω	†1.5KΩ	†1KΩ	470KΩ		
V 4	6X4	200Ω	TP	.1Ω	.1Ω	TP	200Ω	300KΩ		

PROTOGRAPH
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cycle tape, rock play-record head (36) back and forth, loosening two screws (34) alternately until a maximum reading is obtained on the output meter or AC voltmeter. This adjustment should be made carefully to avoid damage to the head mechanism.

TROUBLES AND REMEDIES

Motor Fails To Operate-

1. Motor defective electrically.

2. Bent or binding motor shaft.

3. Thrust bearing screw (105) too tight.

Capstan Shaft Fails To Rotate In "Play" And "Record", But Motor Operates-

1. Broken or disconnected spring (107).

2. Binding motor shaft plate assembly (94).

Push Buttons Fail To Remain Depressed-

1. Improper operation of push button lock plate.

2. Bent push button.

Erase And Record Pads Fail To Move Forward Properly In Play And Record-

1. Broken or disconnected tension spring (29).

2. Binding Pad Assembly (28 or 40).

Pressure Roller Fails To Engage Capstan Shaft In Play Or Record-

1. Broken or disconnected tension spring (44).

2. Binding roller assembly (41).

Record Safety Lever Fails To Return Forward And Lock Play Button-

1. Disconnected or broken spring (55).

2. Loose or misadjusted bell crank (26).

Take-Up Reel Fails To Rotate In Record Or Playback-

1. Brake pad assembly (148) improperly adjusted.

2. Loose or broken belts (72 or 142).

3. Clutch assembly (consisting of 69, 70, 71, 74, 75, 77, 78 and 79) improperly adjusted or faulty.

4. Binding or bent supply reel spindle (1).

Supply Reel Fails To Yield Tape In Record Or Playback-

1. Binding or bent supply reel spindle (1).

2. Improperly adjusted brake pads (148).

Failure To Fast Rewind-

1. Loose set screw (123) on pulley cam, and idler link assembly (124); faulty assembly.

2. Improperly adjusted brake pad assembly (148).

3. Broken or loose belt (142).

4. Broken or disconnected spring (128).

Poor Or No Recording And Playback Of Tape-

1. Improper recording head alignment.

2. Worn recording head pressure pad (40).

3. Broken or disconnected tension spring (29).

Failure To Erase-

1. Improper adjustment of erase magnet or tape guide (15) (See "Erase Adjustment").

2. Worn erase pad (28).

3. Broken or disconnected tension spring (25).

Monitor Fails To Operate-

1. Loose or misadjusted switch arm (65).

2. Broken or disconnected tension spring on right section of monitor switch.

Failure To Fast Forward-

1. Broken or loose belt (72).

2. Improper clutch action due to glazed or worn cork disc (76).

3. Faulty pulley, cam, and idler link assembly (124).

Operation Of Speed Control Does Not Change-

Tape Speed-

1. Binding action in raising lever and stud assembly (81 and 82).

2. Loose or misadjusted screw on raising lever and stud assembly (81 and 82).

Wow-Waver-

1. Worn or pitted rubber rim drive on the capstan flywheel (66).

2. A bent capstan shaft (12) can cause erratic speed. The surface of the shaft in contact with the tape must be kept free of oil, adhesive and iron oxide particles.

3. A worn, pitted, or dirty pressure roller (46) will cause poor tape transport.

MAINTENANCE

Cleaning The Play-Record Head-

The play-record head is subject to an accumulation of tape coating residue which is worn off the tape as it passes the head. This should be periodically removed since it may cause faint recordings and poor playback. Wipe off the record and head contact surfaces carefully with a clean cloth. If dirt is caked or hard and will not come off with a dry cloth, dampen the cloth slightly with carbon tetrachloride.

NOTE: Do not use a brush or excessive amount of solvent on the head surface.

Lubrication-

Extreme care should be taken when lubricating the mechanism. For satisfactory operation the instructions in this section should be followed:

1. Mechanical linkage should be lubricated lightly at points of friction with a high temperature grease of medium consistency (BRB No. 1 grease of approximately 300 consistency is used in the factory lubrication of this recorder).

2. The shafts of rotating parts, when replaced should be wiped clean with a lint-free cloth or paper and oiled lightly with a drop of two of No. 10 oil.

ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
V1	53P045	6AV6, Pre. Amp.	R9	29M6822	Resistor, 6. 8K, 1/2 W.
V2	53P028	12AX7, A. F. Amp.	R10	29M1052	Resistor, 1Meg, 1/2 W.
V3	53P037	6AQ5, Bias Osc. -Output	R11	29M2232	Resistor, 22K, 1/2 W.
V4	53P025	6X4, Rectifier	R12	29M1052	Resistor, 1Meg, 1/2 W.
C1A	30P049	Elect. Cap., 25MFD@450V.	R13	29M3332	Resistor, 33K, 1/2 W.
C1B		Elect. Cap., 15MFD@350V.	R14	29M3332	Resistor, 33K, 1/2 W.
C2A	30P5050	Elect. Cap., 15MFD@250V.	R15	29M1506	Resistor, 15K, 1/2 W.
C2B		Elect. Cap., 15MFD@350V.	R16	29M5632	Resistor, 56K, 1/2 W.
C2C		Elect. Cap., 40MFD@25V.	R17	29M2732	Resistor, 27K, 1/2 W.
C3	30P052	Cap. Paper, .02MFD@400V.	R18	29M1042	Resistor, 100K, 1/2 W.
C4	30P198	Cap. Ceramic, 750MMF@500V.	R19	29M4752	Resistor, 4. 7Meg, 1/2 W.
C5	30P093	Cap. Molded Paper, .0068MFD@600V	R20	29M1042	Resistor, 100K, 1/2 W.
C6	30P199	Cap. Ceramic, 20000MMF@500V.	R21	29M1022	Resistor, 1K, 1/2 W.
C7	30P210	Cap. Ceramic, 200MMF@500V.	R22	29M3922	Resistor, 3. 9K, 1/2 W.
C8	30P146	Cap. Ceramic, 270MMF@500V.	R23	29M1542	Resistor, 150K, 1/2 W.
C9	30P180	Cap. Ceramic, 100MMF@500V.	R24	29M5632	Resistor, 56K, 1/2 W.
C10	30P209	Cap. Ceramic, 10000MMF@500V.	R25	29M4742	Resistor, 470K, 1/2 W.
C11	30P042	Cap. Paper, .05MFD@400V.	R26	29M2713	Resistor, 270Ω, 1W.
C12	30P052	Cap. Paper, .02MFD@400V.	R27	29M2281	Resistor, 2. 2Ω, 2 W.
C13	30P203	Cap. Ceramic, 5000MMF@500V.	R28	29M1052	Resistor, 1Meg, 1/2 W.
C14	30P042	Cap. Paper, .05MFD@400V.	R29	29M3342	Resistor, 330K, 1/2 W.
C15	30P207	Cap. Trimmer, 3-30MMF	R30	29M3332	Resistor, 330K, 1/2 W.
C16	30P146	Cap. Ceramic, 270MMF@500V.	R31	29M1506	Resistor, 15Ω, 1/2 W.
C17	30P042	Cap. Paper, .05MFD@400V.	R32	29M1042	Resistor, 100K, 1/2 W.
C18	30P042	Cap. Paper, .05MFD@400V.	R33	29M1042	Resistor, 100K, 1/2 W.
C19	30P146	Cap. Ceramic, 270MMF@500V.	R34	29P064	Resistor, 1K, 3W.
C20	30P154	Cap. Molded Paper, .047MFD@400V.	T1	68P027	Power Transformer
R1	31P087	Volume Control, 250K, 1/2 W.	T2	68P038	Output Transformer
R2	31P086	Tone Control, 500K, 1/2 W.	L1	65P102	Osc. Coil
R3	31P091	Neon Overload Ind. Adj., 1Meg., 1/2 W	SP1	76P036	Speaker 5 x 7 Oval PM
R4	31P091	Neon Normal Ind. Adj., 1Meg, 1/2 W.	M1	32P101	Selector Switch
R5	31P090	Hum Control 500Ω, 1/2 W.	M2	53P017	Neon Overload Ind. NE51
R6	29M4752	Resistor, 4. 7Meg, 1/2 W.	M3	53P017	Neon Normal Ind. NE51
R7	29M5622	Resistor, 5. 6K, 1/2 W.	M4	32P095	Equalizing Switch
R8	29M1542	Resistor, 150K, 1/2 W.	M5	53P030	Pilot Lamp #47

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	42X353	Reel Spindle	18	25P036	Washer
2	45P1794	Plate Cover	19	26P1376	Screw, Rd. Hd. M-40 x 3/16
3	25P361	Washer	20		Washer
4	25P644	Washer	21	11X1222	Shoe and Magnet
5	39P114	Volume Control Knob	22	46P376	Tension Spring
6	49P216-1	On-Off Control	23	45P1752	Magnet Carriage
7	39P114	Tone Control Knob	24	25P036	Washer
8	49P216-2	Monitor Knob	25	46P369	Tension Spring
9	11X1220	Speed Selector Knob	26	11X1162	Bell Crank and Hub Asm.
10	49P220	Head Cover	27	25P584	"C" Washer
11	49P221	Escutcheon	28	11X1166	Pressure Arm and Pad Asm.
12	41P1351	Capstan Shaft	29	46P252	Tension Spring
13	42P354	Fast Speed Knob	30	26P747	Mounting Screw 8-32 x 1/4
14	26P1367	Hex. Nut 8-32	31		Base Plate Assembly
15	41P1357	Tape Guide	32	46P380	Spring, Editing Lever
16	45P1766	Tape Guide Support	33	11X1210	Edit Lever
17	26P1367	Hex. Nut 8-32	34	26B1365	Head Screw

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Ref. No.	Part No.	Description
35		Washer
36	11X1224	Record Head
37	45P1846	Tape Guide
38	25P535	"C" Washer
39	25PP622	Washer Shim (1 to 3)
40	45P1856	Pressure Pad and Bracket
41	11X1212	Roller Arm and Pin Asm.
42	11X1169	Lever, Spring and Pin Asm.
43	46P368	Tension Spring
44	46P416	Tension Spring
45	11X1211	Pivot and Washer Asm.
46	11X1151	Pressure Roller
47	25P620	"C" Washer
48	11X1181	Push Button Assembly
49	46P374	Actuator Spring
50	46P364	Stop Spring (3)
51	49P214-1	Record Key
52	49P214-2	Stop Key
53	49P214-3	Play Key
54		Safety Lever (Part of 48)
55		Safety Release Spring
56	46P012	Spring, Compression
57		Washer
58	46P362	Spring, Reel Spindle Compression
59	45P1784	Clutch Yoke
60	41P1334	Coupling Tube
61	26P629	Set Screw, Bristol 8-32 x 1/4
62		Belt Guide
63		Washer
64		"C" Washer
65	45P1779	Switch Arm
66	11X1152	Capstan Fly Wheel
67	25P643	Washer
68		Spring
69	11X1366	Clutch Pulley
70	23P019	Clutch Disc
71	11X1183	Clutch Pulley and Bearing
72	72P001	Small Drive Belt
73	11X1205	Bearing Disc and Hub Asm.
74		Washer
75	41P1348	Bushing, Clutch
76	11X1173	Brake Drum Asm.
77	46P354	Tension Spring
78	41P1348	Bushing, Clutch
79	26P1349	Stop Nut 10-32
80	11X1176	Motor Mounting Plate Assy.
81	11X1194	Raising Lever and Stud Asm.
82	41P1367	Shift Rod and Pin Asm.
83	46P381	Tension Spring, Shift Rod
84	45P1785	Shift Plate
85	25P306	Lock Washer
86	26P194	Screw Rd. Hd. M. 6-32 x 3/16
87		"C" Washer
88		Washer
89		Lever
90	25P551	Grommet, Motor Mounting
91	23P020	Felt Washer, Motor Shift Plate
92	26P747	Mounting Screw 8-32 x 1/4
93	15X188	Motor Assembly
94	11X1171	Motor Shift Plate and Stud Asm.
95	23P020	Felt Washer
96	25P396	Washer
97	23P020	Felt Washer
98	25P396	Washer
99		Washer
100	25P535	"C" Washer
101	45P1181	Fan Blade
102		Bracket (Part of 103)
103	17X509	Adjusting Screw and Bracket Asm.
104	26P1070	Bracket Mounting Screw (2)
105	41P589	Thrust Bearing Screw
106	26P077	Nut
107	46P371	Spring, Shift Plate Tension
108	26P028	Hex. Nut (2)
109	45P1896	Switch Actuator
110	46P367	Tension Spring
112	11X1196	Play Slide Assembly
113	46P370	Tension Spring
114	26P819	Bristol Set Screw 6-32 x 3/16 (2)
115	11X1204	Lever and Hub Asm.
116	45P1755	Motor Shift Arm
117	46P395	Spring, Actuator Tension
118		Tension Spring
119	25P643	Washer
120	11X1180	Brake Lever and Pad
121	45P1756	Cam Follower
122		Washer
123	26P676	Set Screw 8-32 x 3/16
124	11X1195	Pulley, Cam and Idler Link Asm.
125		Washer
126	42P348	Capstan Casting
127	45P1754	Idler Cam
128	46P356	Torsion Spring
129	25P643	Washer
130	25P584	"C" Washer
131		Pressure Spring
132		Screw
133	25P474	"C" Washer
134	46P379	Idler Retracting Spring
135	11X1172	Rewind Idler Arm and Pivot
136	11X1187	Actuator, Record Listen Asm.
137	25P643	Washer
138	11X1168	Pulley and Bearing Asm.
139	25P643	Washer
140	25P584	"C" Washer
141	46P395	Spring, Actuator Tension
142	72P002	Large Drive Belt
143		Idler Link (Part of Item 124)
144	46P389	Torsion Spring
145	50P359	Retaining Ring
146	26P079	Screw Rd. Hd. M. 6-32 1/2
147	46P391	Tension Spring
148	11X1158	Brake Band and Pad Asm.
149	26P676	Set Screw
150	11X1174	Drum and Hub Asm.

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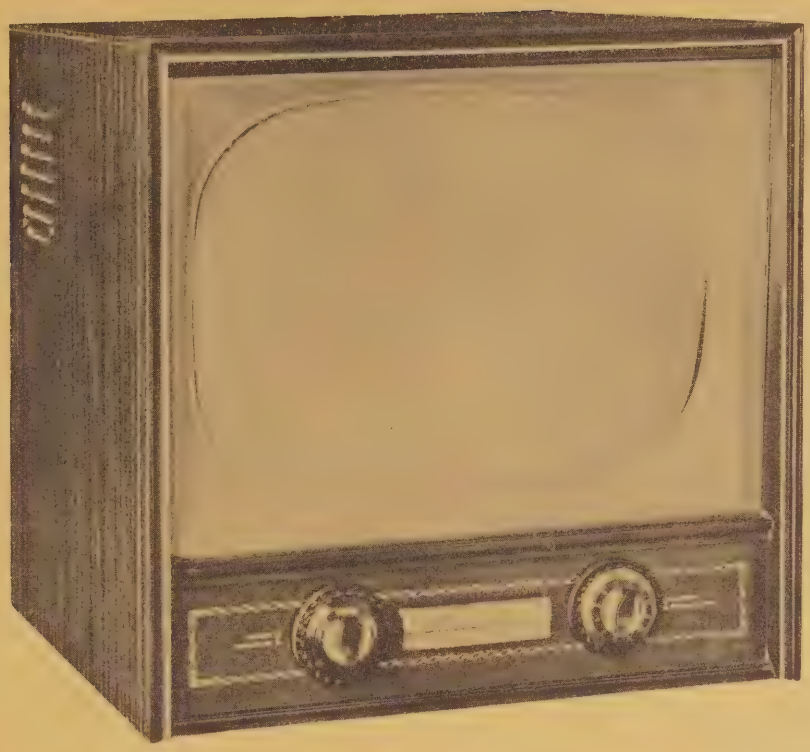

WELLS-GARDNER 321AM50-A-432,
321AM50-A-486, 2321AM50-A-488-1

WELLS-GARDNER MODEL 321AM50-A-432

TRADE NAME	Wells-Gardner Models 321AM50-A-432, 321AM50-A-486, 2321AM50-A-488-1
MANUFACTURER	Wells-Gardner & Co., 2701 N. Kildare Ave., Chicago 39, Ill.
TYPE SET	Television Receiver
TUBES	Twenty-four
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 1.74 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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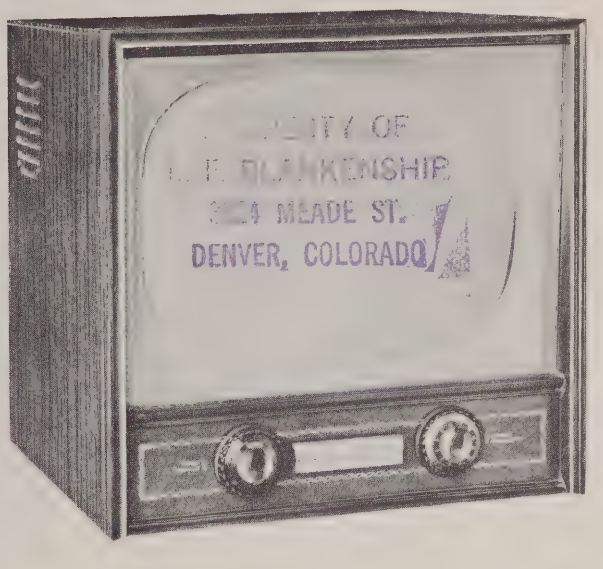
WELLS-GARDNER 321AM50-A-432, 321AM50-A-486, 2321AM50-A-488-1



DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type control knobs and fine tuning lever from front panel of cabinet.

2. Remove 2 wood screws and 2 metal screws. Remove rear cover.

3. Loosen 4 wood screws. Remove 2 antenna brackets.

4. Remove speaker leads.

5. Remove 5 chassis bolts. Remove chassis.

6. Remove 4 speaker nuts. Remove speaker.

MODELS

321AM50-A-432, 321AM50-A-486 ,
2321AM50-A-488-1

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF tuner oscillator circuit may be accomplished as follows:

1. Set the selector knob to VHF position.

2. Tune in a TV station and set the fine tuning control to the center of its range.

3. Remove the channel selector and fine tuning knobs.

4. Adjustments are accessible one at a time thru the small hole above and slightly to the left of the channel switch shaft.

To adjust the UHF oscillator, set the channel selector knobs to the desired UHF channel. The fine tuning lever should be at the center of its range. Remove knobs and adjust the oscillator slug, thru the same hole as for VHF adjustments.

If two UHF channels are received and use the same UHF coil strips, the oscillator should be set for the channel closest to the center of the group.

PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass, remove 5 wood screws holding plastic strip at the top of the safety glass. Remove plastic strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See Tube Placement Chart on Page 5.

SPECIAL ADJUSTMENTS

A. AGC Threshold Control

Tune in the strongest TV station available. Turn the AGC threshold control clockwise until a buzz in the sound and a washed out picture appears, then turn the control slightly counter clockwise for clearest picture and best sound.

B. Sync Stability Control

With the picture locked in slowly turn the sync stability control clockwise until bending occurs at top of picture. Turn control slightly counter clockwise until bending disappears. In general, the weaker the signal area the more clockwise the control should be turned.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontal hold control to its mid-range position and adjust the horizontal oscillator coil (L36) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L35) located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for LV power supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

WELLS-GARDNER 321AM50-A-432, 321AM50-A-486, 2321AM50-A-488-1

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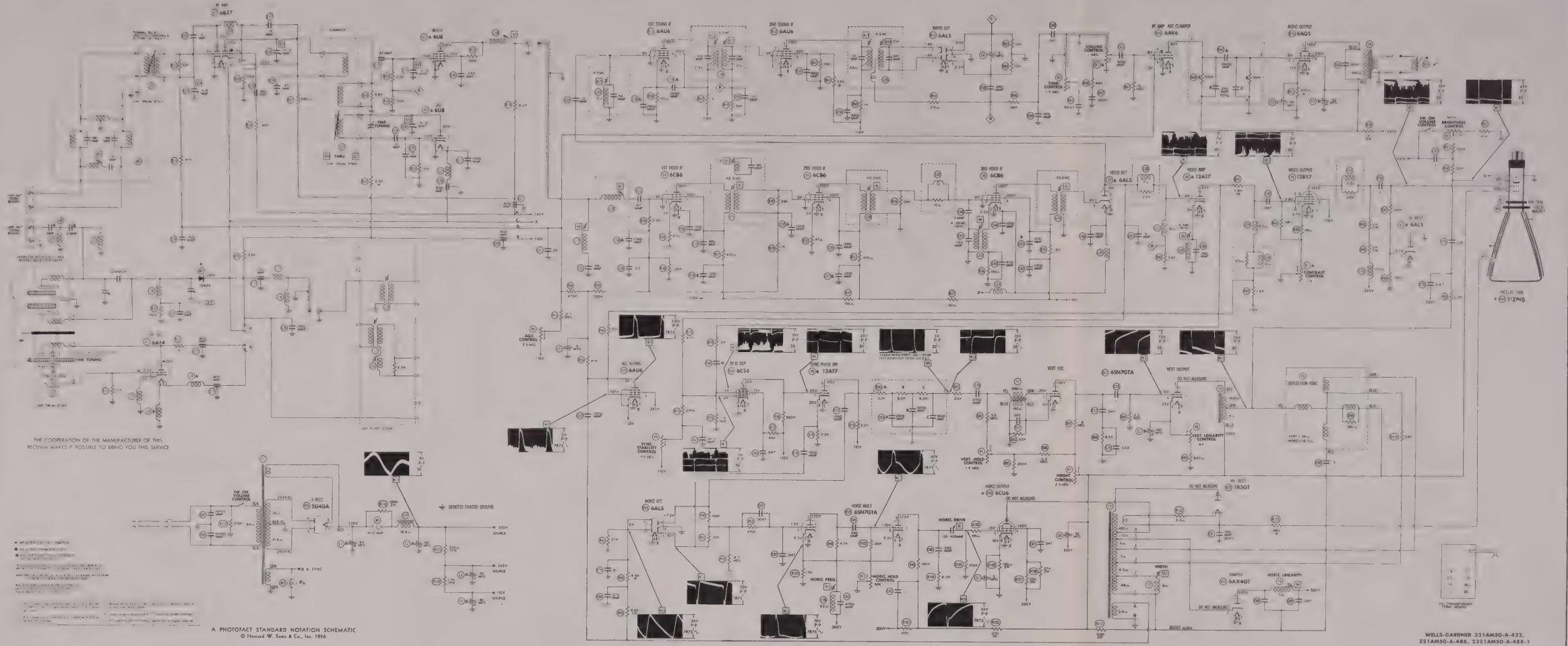
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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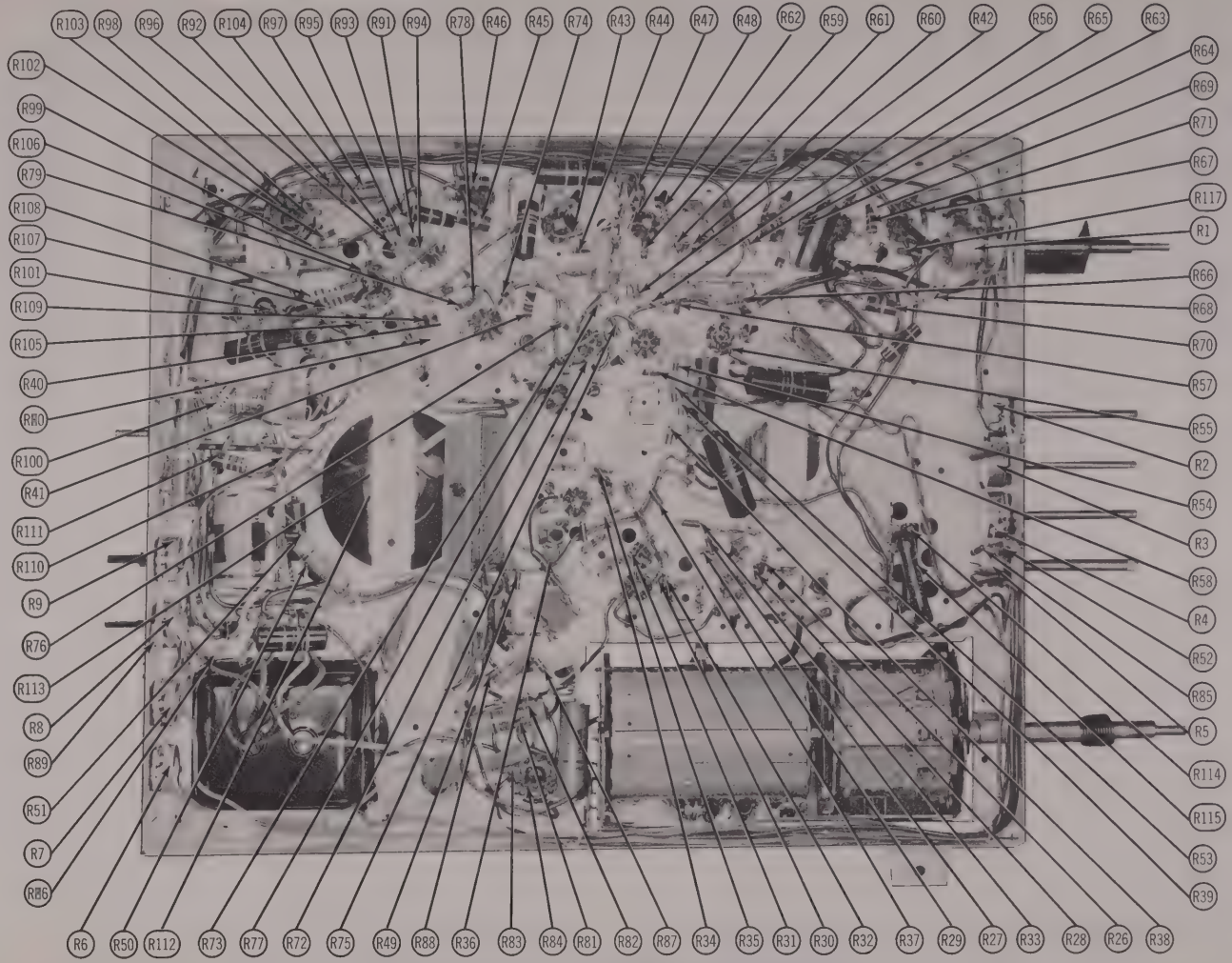
WELLS-GARDNER 321AM50-A-432, 321AM50-A-486, 2321AM50-A-488-1



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

WELLS-GARDNER 321AM50-A-432,
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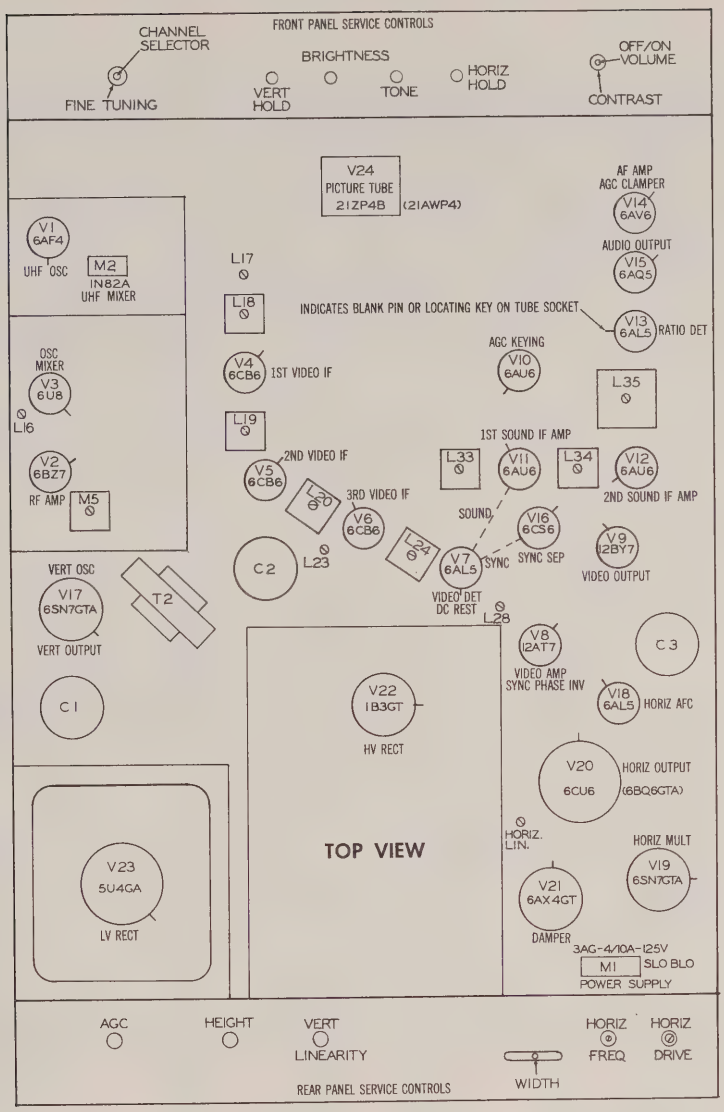
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V23, Fuse (M1)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6, V7 (V1 UHF only)**
No pic, no sound, has snow - **V2, V3, V4**
No pic, has sound, has raster - **V8, V9, V10, V24**
Has pic, no sound - **V11, V12, V13, V14, V15**
Overloaded picture - **V10, V14**

SYNC FAILURE
No vert. sync - **V8, V17**
No horiz. sync - **V8, V18, V19**
No vert. or horiz. sync - **V8, V16**

SWEEP FAILURE
No raster, has sound - **V19, V20, V21, V22, V24**
No vertical deflection - **V17**
Poor vert. linearity or foldover - **V17**
Poor horiz. linearity or foldover - **V19, V20, V21**
Narrow picture - **V19, V20, V21, V22, V23**
Vert. off freq. - **V8, V17**
Horiz. off freq. - **V8, V18, V19**

DENVER, COLORADO

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from chassis. Do not remove the horizontal multivibrator tube (V11) to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5 volt battery to the ungrounded side of C34A. Connect the positive lead to chassis. Remove the RF Amplifier Tube (V3) from its socket.
Connect the synchronised sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
①	Direct	High side to an ungrounded tube shield floating over dummy converter tube (V3). Low side to chassis.	44MC (10MC Swp.)	41.25MC 45.75MC 47.25MC	Any unused channel	Vert. Amp. thru detector(Fig.1) to pin 5 (plate) of 6CB6 (V4). Low side to chassis.	A1, A2, A3, A4	Adjust A1 to place 47.25MC marker in trap notch as in Fig. 2. Adjust A2, A3 and A4 for response similar to Fig. 2. A3 and A3 affects flat portion of curve. A4 positions 41.25MC marker. Make sure 45.75MC marker is on peak as shown or the 44.5MC marker on overall response curve (Fig.3) will be incorrect.
②	"	"	Not used.	42.5MC (Unmod.)	"	Use VTVM DC probe to point ◇. Common to chassis.	A5	Increase bias from 1.5 volts to 4.5 volts at ungrounded side at C34A. Attenuate generator output to maintain 1 volt at VTVM. Adjust for maximum deflection.
③	"	"	"	45.3MC	"	"	A6	"
④	"	"	"	43.9MC	"	"	A7	"
⑤	"	"	"	41.35MC	"	"	A8	Adjust for MINIMUM deflection.
⑥	"	"	44MC (10MC Swp.)	41.25MC 42.25MC 43.9MC 44.5MC 45.3MC 45.75MC 47.25MC	"	Vert. Amp. thru 10KΩ to point ◇. Low side to chassis.		Check for response similar to Fig. 3. SLIGHTLY retouch A5 thru A8 to obtain desired response. If A1 thru A4 requires retouching, step 1 should be repeated. To observe 41.25 and 47.25MC trap markers increase sweep generator output. A7 affects flat portion of curve. A8 affects high frequency side and A5 affects the low frequency side of the response curve.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
⑦	10KΩ resistor	High side thru a 10KΩ to pin 2 (plate) of 6AL5 (V7A). Low side to chassis.	4.5MC (Unmod.)	Any noninterfering channel	DC probe thru detector (Fig. 4) to pin 2 (grid) of picture tube. Common to chassis.	A9	Set contrast control fully clockwise. Adjust for minimum deflection.

ALTERNATE 4.5MC TRAP ALIGNMENT

Replace the RF amplifier tube (V2) and remove bias. Tune in a TV station and adjust A9 for minimum 4.5MC beat interference in picture.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

If a signal generator providing 4.5MC signal of crystal is not available restore the set to normal operating condition and tune in a local TV station. Connect the VTVM and adjust A10 thru A14 as in steps 8, 9 and 10.
Remove 6CB6 (V6) from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
⑧	10KΩ Resistor	High side thru 10KΩ to pin 2 (plate) of 6AL5 (V7A). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point ◇. Common to chassis.	A10, A11 A12	Adjust for maximum deflection.
⑨	"	"	"	"	DC probe to point ◇. Common to chassis.	A13	Use only enough signal generator output to provide useable indication on VTVM. Adjust for maximum deflection
⑩	"	"	"	"	DC probe to point ◇. Common to chassis.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Replace V6 in its socket.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Remove 6CB6 (V6) from its socket.
Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
⑧	10KΩ resistor	High side thru 10KΩ to pin 2 (plate) of 6AL5 (V7A). Low side to chassis.	4.5MC (450KC Swp.	4.5MC	Any	Vert. Amp. to point ◇. Low side to chassis.	A10, A11 A12	Adjust for curve of maximum amplitude and symmetry similar to Fig. 5.
⑨	"	"	"	"	"	Vert. Amp. to point ◇. Low side to chassis.	A13	Disconnect stabilizing capacitor C4. Use only enough sweep generator output to provide useable indication on scope. Adjust for curve of maximum amplitude and symmetry similar to Fig. 5.
(10)	"	"	"	"	"	Vert. Amp. to point ◇. Low side to chassis.	A14	Reconnect stabilizing capacitor C4. Adjust so that 4.5MC occurs at center of crossover frequency as in Fig. 6. SLIGHTLY retouch A13 for maximum amplitude and straightness of crossover lines. Replace V6 in its socket.

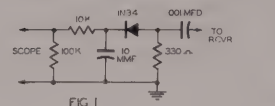


FIG 1

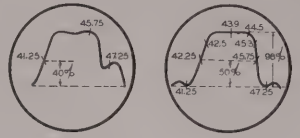


FIG.2

FIG. 3

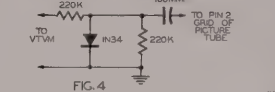


FIG. 4

FIG. 5

FIG. 6

FIG. 7

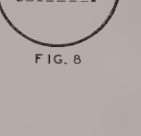


FIG. 8

VHF OSCILLATOR ALIGNMENT

Connect the negative lead of a 4.5 volt battery to the ungrounded side of C34A. Connect the positive lead to chassis.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step using A15. It should be noted that this is an all channel oscillator adjustment and should not be used to correct any individual channel. If adjustment of A15 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment screw for each channel that is off frequency. The channel oscillator adjustment screws are reached through a hole just to the left of the channel switch shaft (hole extends through UHF tuner).
The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronised sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
(11)	Two 120Ω Carbon Resistors	Across VHF Antenna terminals with 120Ω in each lead.	210MC (10MC Swp.)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to point ◇. Low side to chassis.	A16	Adjust to place marker in trap notch as in Fig. 7. Video marker should be at 50%.
			207MC (10MC Swp.)	205.25MC 209.75MC	13		A17	
			201MC (10MC Swp.)	199.25MC 203.75MC	11		A18	
			195MC (10MC Swp.)	193.25MC 197.75MC	10		A19	
			189MC (10MC Swp.	187.25MC 191.75MC	9		A20	
			183MC (10MC Swp.)	181.25MC 185.75MC	8		A21	
			177MC (10MC Swp.)	175.25MC 179.75MC	7		A22	
			85MC (10MC Swp.)	83.25MC 87.75MC	6		A23	
			79MC (10MC Swp.)	77.25MC 81.75MC	5		A24	
			69MC (10MC Swp.)	67.25MC 71.75MC	4		A25	
			63MC (10MC Swp.)	61.25MC 65.75MC	3		A26	
			57MC (10MC Swp.)	55.25MC 59.75MC	2		A27	

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 3 volt battery to the ungrounded side of C3L. Connect the positive lead to chassis.
Connect the synchronised sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
(12)	Two 120Ω Carbon Resistors	Across VHF Antenna terminals with 120Ω in each lead.	207MC (10MC Swp.)	205.25MC 209.75MC	13	Vert. Amp. thru 10KΩ to point ◇. Low side to chassis.	A28, A29 A30	Adjust for response similar to Fig. 8, with markers above 90%.
(13)	"	"	213MC (10MC Swp.)	211.25MC 215.75MC	13	"		If markers fall below 70% on any channel, make compromise adjustments of A28, A29 and A30 with channel switch set to that channel. Then check all other channels to see that they have not been seriously affected.
			203MC (10MC Swp.)	201.25MC 203.75MC	11			
			193.25MC (10MC Swp.)	193.25MC 197.75MC	10			
			189MC (10MC Swp.)	187.25MC 191.75MC	9			
			183MC (10MC Swp.)	181.25MC 185.75MC	8			
			177MC (10MC Swp.)	175.25MC 179.75MC	7			
			85MC (10MC Swp.)	83.25MC 87.75MC	6			
			79MC (10MC Swp.)	77.25MC 81.75MC	5			
			69MC (10MC Swp.)	67.25MC 71.75MC	4			
			63MC (10MC Swp.)	61.25MC 65.75MC	3			
			57MC (10MC Swp.)	55.25MC 59.75MC	2			

IF WAVE TRAP ADJUSTMENT

The IF wave trap should be tuned to minimize interference caused by signals which fall within the video IF amplifier pass (40-48MC). Tune in a station on which the interference is noted and adjust A31 for minimum interference in the picture.

UHF OSCILLATOR ADJUSTMENT

The UHF oscillator channel strip adjustment screws are reached through the same hole provided for VHF channel oscillator adjustment screws. Tune in all UHF stations available and check each one to see if the fine tuning control can be tuned through a point where clearest picture and best sound occur. If the fine tuning control does not have sufficient range on any UHF channel strip set the fine tuning control to its mid-range position and then adjust the UHF channel strip oscillator screw for clearest picture and best sound.

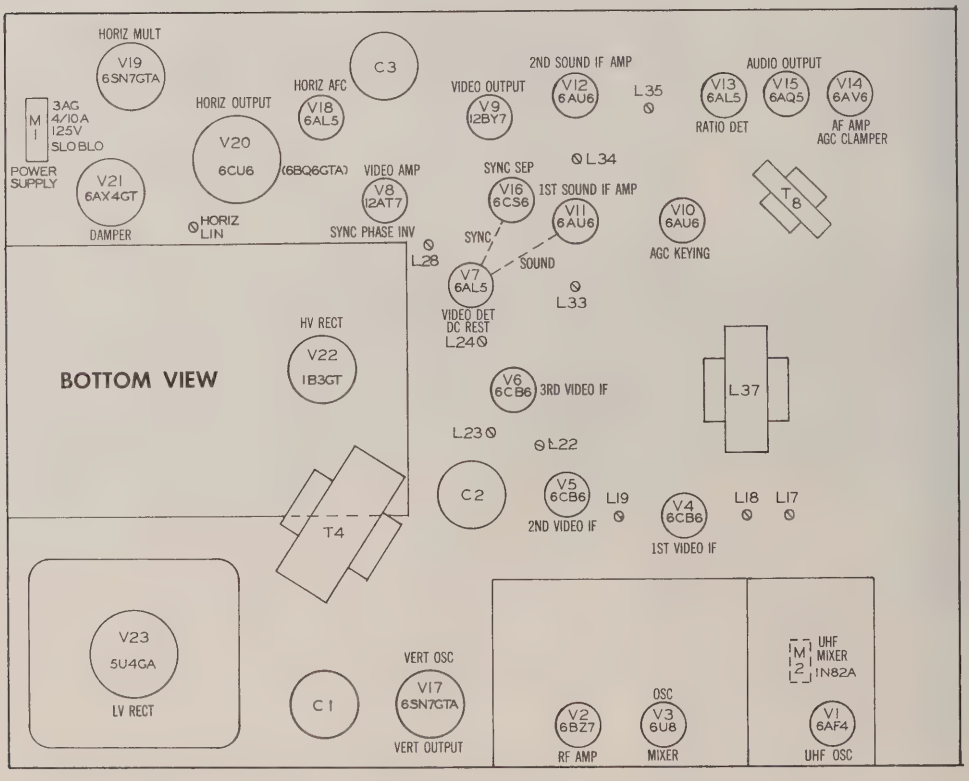
UHF RF ALIGNMENT

The UHF RF portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion is not recommended in the field.

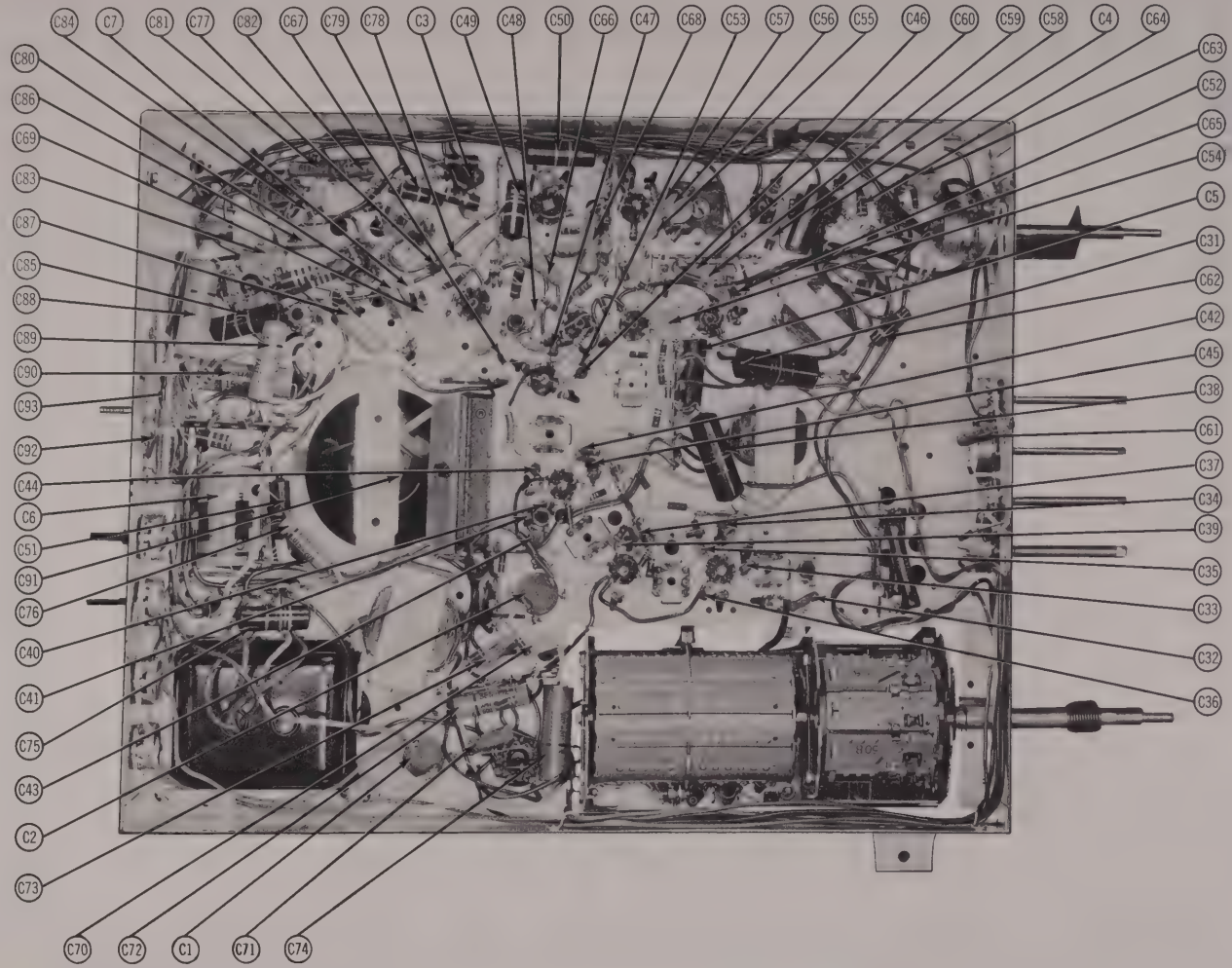
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	*†6.3KΩ	10KΩ	.1Ω	0Ω	0Ω	10KΩ	*†6.3KΩ		
V 2	6BZ7	†1.1KΩ	130KΩ	Inf.	0Ω	.1Ω	Inf.	950KΩ	0Ω	†1.1KΩ
V 3	6U8	†5.3KΩ	200KΩ	†110KΩ	.1Ω	0Ω	†8.5KΩ	0Ω	0Ω	10KΩ
V 4	6CB6	100KΩ	47Ω	0Ω	.1Ω	†2.8KΩ	†2.8KΩ	0Ω		
V 5	6CB6	100KΩ	47Ω	0Ω	.1Ω	†2.7KΩ	†2.7KΩ	0Ω		
V 6	6CB6	.2Ω	180Ω	0Ω	.1Ω	†3.5KΩ	†3.5KΩ	0Ω		
V 7	6AL5	1Meg	3.9KΩ	.1Ω	0Ω	.5Ω	0Ω	0Ω		
V 8	12AT7	†9KΩ	3.9KΩ	.3Ω	0Ω	0Ω	†5.3KΩ	†820KΩ	3.3KΩ	.1Ω
V 9	12BY7	250Ω	1Meg	0Ω	.1Ω	.1Ω	0Ω	†4.3KΩ	†2.1KΩ	0Ω
V 10	6AU6	†35KΩ	†2.1KΩ	.1Ω	0Ω	500KΩ	†400Ω	†2.1KΩ		
V 11	6AU6	2Ω	0Ω	0Ω	.1Ω /	†3KΩ	†3KΩ	100Ω		
V 12	6AU6	56KΩ	0Ω	.1Ω	0Ω	†3KΩ	†.8KΩ	0Ω		
V 13	6AL5	Inf.	Inf.	.1Ω	0Ω	10KΩ	0Ω	10KΩ		
V 14	6AV6	10Meg	0Ω	.1Ω	0Ω	900KΩ	900KΩ	†500KΩ		
V 15	6AQ5	500KΩ	330Ω	0Ω	.1Ω	†1.9KΩ	†1.4KΩ	500KΩ		
V 16	6CS6	50KΩ	0Ω	.1Ω	0Ω	†820KΩ	†70KΩ	1.5Meg		
V 17	6SN7GTA	4.5Meg	▲2.5Meg	190Ω	2.2Meg	▲8.5KΩ	2.5KΩ	0Ω	.1Ω	
V 18	6AL5	4.8Meg	4.8Meg	.1Ω	0Ω	10KΩ	NC	10KΩ		
V 19	6SN7GTA	5Meg	†4.8KΩ	1.5KΩ	200KΩ	†230KΩ	1.5KΩ	.1Ω	0Ω	
V 20	6CU6	TP	0Ω	TP	†16KΩ	470KΩ	TP	.1Ω	100Ω	TOP CAP ▲15Ω
V 21	6AX4GT	TP	NC	1.5Meg	TP	†60Ω	NC	.1Ω	0Ω	
V 22	1B3GT		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▲435Ω
V 23	5U4GA	Inf.	45KΩ	Inf.	20Ω	Inf.	22Ω	Inf.	45KΩ	
V 24	21ZP4B	0Ω	1.1Meg	PIN 10 ▲6.8KΩ	PIN 11 †240KΩ	PIN 12 .1Ω				

*MEASURED IN "UHF" POSITION.
†MEASURED FROM PIN 2 OF V23.
▲MEASURED FROM PIN 3 OF V21.
TP-TIE POINT.
NC-NO CONNECTION.
ALL MEASUREMENTS TAKEN IN "VHF" POSITION UNLESS OTHERWISE DESIGNATED.



TUBE PLACEMENT CHART



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		Wells-Gardner PART No.	STANDARD REPLACEMENT		
V1	UHF Osc.	6AF4	6AF4	7DK	
V2	VHF RF Amp.	6BZ7	6BZ7	9AJ	
V3	VHF Mixer-Osc.	6U8	6U8	9AE	
V4	1st. Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Det.- DC Restorer	6AL5	6AL5	6BT	
V8	Video Amp.- Sync Phase Inv.	12AT7	12AT7	9A	
V9	Video Output	12BY7	12BY7	9BF	
V10	AGC Keying	6AU6	6AU6	7BK	
V11	1st. Sound IF Amp.	6AU6	6AU6	7BK	
V12	2nd. Sound IF Amp.	6AU6	6AU6	7BK	
V13	Ratio Det.	6AL5	6AL5	6BT	
V14	AF Amp.- AGC Clamper	6AV6	6AV6	7BT	
V15	Audio Output	6AQ5	6AQ5	7BZ	
V16	Sync Separator	6CS6	6CS6	7CH	
V17	Vert. Osc.- Vert. Output	6SN7GTA	6SN7GTA	8BD	
V18	Horiz. AFC	6AL5	6AL5	6BT	
V19	Horiz. Mult.	6SN7GTA	6SN7GTA	8BD	
V20	Horiz. Output	6CU6	6CU6	6AM	6BQ6TA used as alternate
V21	Damper	6AX4GT	6AX4GT	4CG	
V22	HV Rectifier	1B3GT	1B3GT	3C	
V23	LV Rectifier	5U4GA	5U4GA	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA					RETMA BASE TYPE	NOTES
	Wells-Gardner PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.		
V24	21ZP4B ①	21ZP4B ①	21ZP4B ①	21ZP4B ②	21ZP4B ①	12N	① Aluminized
		21ZP4A	21ZP4A	21ZP4A	21ZP4A	12N	② Silver Screen
				21ZP4 ③		12D	③ Circuit Change Necessary
	21AWP4	21AWP4			21AWP4	12N	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	Wells-Gardner PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	▲80	400	45X390	FP229.4	TM-D80-450	T-180	
B	▲60	400					
C2A	▲80	400	45X391	FP229.8	TM-3057	T-720	
B	▲100	50					
C3A	■20	400	45X392		TM-D20-450	D-215	
B	▲20	400			TD-50-50	MT-0550	
C	40	50					
C4	5	25	45X378	TC30	TD-5-25	MMT-0505	
C5	4	100	45X361	TC40	TD-4-150	MT-1504	
C6	30	400	45X393	TC77	TD-30-450	FM-4530	
C7	5	25	45X378	TC30	TD-5-25	MMT-0505	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	Wells-Gardner PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	
C8A	1						
B	2						
C9	120			DD-121	811-121	UC-5312	
C10	800		13M-23E801Z	MFT-1000			
C11	800		13M-23E801Z	MFT-1000			
C12	10		13M-20A-100D-N-1				
C13	3-8			829-10			
C14	1500		13L-8XA152Z	DD-152	801-0015	DC-5215	
C15	3		13L-8C030H	TCZ-3R3	NP0A-030	ZT-5533	
C16	.5-3		31A-056-1	829-3	3115-01-0R5	CT565A	
C17	1.5		13L-831R5C	TCZ-1R5	NP0A-1R5	ZT-5515	
C18	800		13M-23E801Z				
C19	47		13L-80470K	DD-470	831-470	UC-5447	
C20	800		13M-23E801Z				
C21	800		13M-23E801Z				
C22	47		13M-20U470K	MFT-50			
C23	.5-3		31A-056-1	829-3	3115-01-0R5	CT565A	
C24	10		13L-8U100F	TCN-10	N750K-100	NT-541	
C25	5		13L-8UA050C				
C26	.5-3		31A-056-1	829-3	3115-01-0R5	CT565A	
C27	1500		13L-8XA152Z	DD-152	801-0015	DC-5215	
C28	1500		13L-8XA152Z	DD-152	801-0015	DC-5215	
C29	800		13M-23E801Z				
C30	220		13L-12D221K	DD-221	811-221	UC-5322	
C31	.22	200	RCP10M2224M			PT4022	
C32	36		47X626				
C33	47		47X603	D6-470	GP1K-470	UC-5447	
C34A	1000		80X3	DD2-102	812-001	DCD-521	
B	1000						
C35	680		80X5	DD-681	811-681	UC-5368	
C36	1000		80X1	DD-102	801-001	DC-521	
C37A	1000		80X3	DD2-102	812-001	DCD-521	
B	1000						
C38	.22	200	RCP10M2224M			PT4022	
C39	680		80X5	DD-681	811-681	UC-5368	
C40	1.5		47X584	TCZ-1R5	NP0A-1R5	ZT-5515	
C41	150	500	RCM15E151K	D6-151	811-151	MCB236	
C42	470		80X4	DD-471	831-471	UC-5347	Note 1
C43	470		80X4	DD-471	831-471	UC-5347	
C44	1000		80X1	DD-102	801-001	DC-521	
C45	1000		80X1	DD-102	801-001	DC-521	

DENVER, COLORADO

CAPACITORS (cont)

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA Wells-Gardner PART No	CENTRALAB PART No	ERIE PART No	MALLORY PART No	NOTES
C48	1000		80X1	DD-103	901-001	DC-531	
C47	5		47X563	TCS-4R7	NP0A-050	ET-555	
C49	360	500	47X360	TCM-360	M700-333-362		
C49	.047	400	RCP10M4473M	DF-503		PT4147	
C50	.1	400	RCP10M1043M	DF-104		PT401	
C51	.1	200	RCP10M2043M	DF-104		PT401	
C52	1000		80X1	DD-103	901-001	DC-531	
C53	1.5		47X564	TCZ-1R5	M700-1R5	ET-5515	
C54A	10000		80X8	DD8-102	811-01	DC-511	
B	10000				811-01	DC-511	
C55	390		47X904	D6-101	GP1K-101	UC-531	
C56	5000		47X507	DD-502	811-005	DC-531	
C57	5000		47X507	DD-502	811-005	DC-531	
C58	330	500	47X370	D6-331	811-331	UC-5323	
C59	470	500	47X535	D6-471	831-471	UC-5347	
C60	.047	400	RCP10M4473M	DF-503		PT4147	
C61	.0047	400	RCP10M4473M	D6-472	GP2-333-472	PT6247	
C62	.0047	400	RCP10M4472M	D6-472	GP2-333-472	PT6247	
C63	5000		47X507	DD-502	811-005	DC-535	
C64A	10000						
B	250		†76X5	†PC-80	†1406-01		
C							
C65	.0047	600	RCP10M6473M	D6-472	GP3-333-472	PT6347	
C66	.01	400	RCP10M4103M	D6-103	GP2-333-103	PT411	
C67	1000		80X1	DD-102	801-001	DC-531	
C68	.047	400	RCP10M4473M	DF-503		PT4147	
C68A	5000					DC-533	
B	5000		♦76X7	♦PC-100	♦1405-01	DC-533	
C	5000					DC-535	
C70	4700	500	47X543			MCE465	
C71	.033	200	RCP10M2333M	DF-303	817-02	PT4123	
C72	.047	600	RCP10M6473M	DF-503		PT6147	
C73	.022	200	RCP10M2223M	DF-203	817-02	PT4122	
C74	.1	600	RCP10M6104M	DF-104		PT601	
C75	.047	600	RCP10M6473M	DF-503		PT6147	
C76	.015	600	RCP10M6153M	DD8-153		PT6115	
C77	1000		80X1	DD-102	801-001	DC-531	
C78	1000		80X1	DD-103	801-001	DC-531	
C79	.01	400	RCP10M4103M	D6-103	GP2-333-103	PT411	
C80	270	500	RCM20A271K	D6-271	GP3K-271	MC341	
C81	.0047	400	RCP10M4472M	D6-472	GP2-333-472	PT6247	
C82	.047	200	RCP10M2473M	DF-503		PT4147	
C83	4700	500	47X543			MCE465	
C84	390	500	RCM20B391J	TCN-390	M750-334-392	MCE243	
C85	.1	400	RCP10M4104M	DF-104		PT401	
C86	330	500	47X570	D6-331	811-331		
C87	.047	400	RCP10M4473M	DF-503		PT4147	
C88	.1	400	RCP10M4104M	DF-104		PT401	
C89	.047	400	RCP10M4473M	DF-503	-	PT4147	
C90	.18	600	RCP10M6184M			PT6015	
C91	500	30000	47X561	TV3-502	413	HV5003A	
C92	10000		47X615	DD-102	811-01	DC-511	
C93	10000		47X615	DD-103	811-01	DC-511	

Note 1. Some versions use 680MMF in this application (part #86X5).
† Items C64A, C64B, C64C, R69A and R69B are combined in one unit.
When replacing items separately, C64B and C64C should total 2100MMF.
♦ Items C68A, C68B, C69C, R92A, R90B and R80C are combined in one unit.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Wells-Gardner PART No	IRC PART No	CLAROSTAT PART No	CENTRALAB PART No	MALLORY PART No	INSTALLATION NOTES
R1A	1000Ω		78X2)	♦QJ-838	RTV-502	F-4	U-F13L	Contrast (Panel)
B	1Meg					R2-59	U-R16-T254	Volume (Rear) Attach to R1A.
C	Switch					KS-3	U-S-37	Attach to R1B.
R2A	50KΩ	‡	42X361	QU-123	A47-50K-S	AS-31	U-35	Horizontal Hold
B	Shaft		Not Req.	NQ	RS-3/16	AK-4	Not Req.	Attach to R2B.
R3A	1.5Meg	‡	42X334	QU-138	A47-1.5Meg-S	AB-75	U-155	Tone
B	Shaft		Not Req.	NQ	RS-3/16	AK-4	Not Req.	Attach to R3B.
R4A	500KΩ	‡	42X333	QU-133	A47-500K-S	AB-39	U-50	Brightness
B	Shaft		Not Req.	NQ	RS-3/16	AK-8	Not Req.	Attach to R4B.
R5A	1.5Meg	‡	42X339	QU-138	A47-1.5Meg-S	AB-39	U-155	Vertical Hold
B	Shaft		Not Req.	NQ	RS-3/16	AK-4	Not Req.	Attach to R5B.
R6A	2.5Meg	‡	42X359	QU-239	A47-2.5Meg-S	AB-83	TA255L	AGC
B	Shaft		Not Req.	NQ	FKS-1/4	AK-1	Not Req.	Attach to R6B
R7A	2.5Meg	‡	42X359	QU-239	A47-2.5Meg-S	AB-83	TA255L	Height
B	Shaft		Not Req.	NQ	FKS-1/4	AK-1	Not Req.	Attach to R7B.
R8A	8000Ω	‡	42X373	QU-116	A47-10K-S	AB-14	TA14L	Vertical Linearity
B	Shaft		Not Req.	NQ	FKS-1/4	AK-1	Not Req.	Attach to R8B.
R9A	7.5Meg	‡	42X370	QU-142	A47-7.5Meg-S	AB-89	U-82	Picture Stability
B	Shaft		Not Req.	NQ	FKS-1/4	AK-4	Not Req.	Attach to R9B.

♦CONCENTRIKIT EQUIVALENT: K-4 KIT, BASE ELEMENTS AND SHAFTS, B11-108, P6-218 (Panel)
B12-137K, R16-315 (Rear)
76-2 (Switch)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Wells-Gardner PART No	IRC PART No	NOTES
R10	100Ω	‡	12TA5101K	BTS-100	
R11	10KΩ	‡	12TA5103K	BTS-10K	
R12	1000Ω	‡	12TA5102K	BTS-1000	
R13	22KΩ	‡	12TA5223K	BTS-22K	
R14	47KΩ	‡	12TA5473M	BTS-47K	
R15	270KΩ	‡	B84274	BTS-270K	
R16	180KΩ	‡	B84184	BTS-180K	
R17	680Ω	‡	12TA5681K	BTS-680	
R18	6800Ω	‡	12TA5682K	BTS-6800	
R19	100KΩ	‡	12TA5104K	BTS-100K	
R20	100KΩ	‡	12TA5104K	BTS-100K	
R21	10KΩ	‡	12TA5103M	BTS-10K	
R22	3300Ω	‡	12TA5332K	BTA-3300	
R23	100KΩ	‡	12TA5104K	BTS-100K	
R24	8200Ω	‡	12TA5823K	BTS-8200	
R25	33KΩ	‡	12TA5333M	BTS-33K	
R26	3300Ω 5%	‡	B83322		
R27	470Ω	‡	B84471	BTS-470	
R28	470 5%	‡	B83470	BTS-47 5%	
R29	1000Ω	‡	B85102	BTS-1000	
R30	39KΩ 5%	‡	B83393		
R31	470Ω	‡	B85471	BTS-470	
R32	470 5%	‡	B84470	BTS-47 5%	
R33	150Ω	‡	B85151	BTS-150	
R34	39K 5%	‡	B85103		
R35	1500Ω	‡	B84152	BTS-1500	
R36	180Ω	‡	B83393	BTS-180	
R37	150Ω	‡	B85151	BTS-150	
R38	100K	‡	B84104	BTS-100K	
R39	330K 5%	‡	B83334	BTS-330K 5%	
R40	39000 5%	‡	B83392		
R41	5600Ω	‡	C84562		
R42	1500Ω	‡	B84152	BTS-1500	
R43	1Meg	‡	B84105		
R44	68Ω	‡	B84680	BTS-68	
R45	2000Ω	‡	B84202	BTS-2000	
R46	2000Ω	‡	D83202	BTS-2000	
R47	100KΩ	‡	B84104		
R48	1Meg	‡	B84105	BTS-2200	
R49	2200Ω	‡	B84222		
R50	22KΩ	‡	B84223		
R51	100KΩ	‡	B85104		
R52	47KΩ	‡	B85473		
R53	2.7Meg	‡	B84275	BTS-2.7Meg	
R54	470KΩ	‡	B84474	BTS-470K	
R55	47KΩ	‡	B84473		

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Wells-Gardner PART No	IRC PART No	NOTES
R56	2.2Meg	‡	B84225		
R57	1.5Meg	‡	B84155		
R58	8200Ω	‡	B84822		
R59	8200	‡	B84821		
R60	560Ω	‡			
R61	100KΩ	‡	B84104		
R62	470KΩ	‡	B84474		
R63	27KΩ	‡	B84273		
R64	6800Ω	‡	C84682		
R65	6800Ω	‡	C84682		
R66	100KΩ	‡	B84104		
R67	4.7Meg	‡	B85475		
R68	47000 5%	‡	B83472		
R69	180KΩ	‡	B84184		
R100	47KΩ	1	C84473		
R101	47KΩ	‡	B84473		
R102	150KΩ	‡	B83154		
R103	1500Ω	‡	B83152		
R104	82000Ω	‡	B84822		
R105	470ΩΩ	‡	B84474		
R106	68Ω	‡	B85680		
R107	33KΩ	2	D84333		
R108	27KΩ	2	D84273		
R109	100Ω	2	D84101		
R110	5600Ω	‡	B84562		
R111	6800Ω	‡	D84682		
R112	3.3Ω	½	43X235		EW½-3.3
R113	1Meg	1	C85105		BTA-1Meg
R114	1700Ω	10	43X288		
R115	3300	10	43X275		
R116	100KΩ	2	D85104		BTS-100K
R117	270KΩ	1	B85274		BTS-270K

Note 1. In some versions, a 100K ;W resistor is used in this application.
† Items C64A, C64B, C64C, R69A, R69B are combined in one unit.
♦ Items C68A, C68B, C69C, R80A, R80B, R80C are combined in one unit.

TRANSFORMER (POWER)

ITEM No	RATING PRI	RATING SEC 1	RATING SEC 2	RATING SEC 3	RATING SEC 4	RATING SEC 5	REPLACEMENT DATA Wells-Gardner PART No	Halldorson PART No	Merit PART No	RCA TYPE No	Stancor PART No	Thordarson PART No	Triad PART No
T1	117VAC	605VCT	5VAC	6.3VAC			53X339A	P9715 ①	P-2838 ①		P-8333 ②		P-49B8 ②
	@1.7AA	.240ADC	@3A	@5A									

① Parallel and phase 6.3V ④. 5.8A windings for Sec. 3. Tape 6.3V ⑤ 3.3A, and 6.3V ⑥ .85A windings.
② Tape small 6.3V winding.
③ Parallel and phase 5.3V ⑦ 9A and . 9A windings for Sec. 3.
④ Use HV taps on Sec. 1. Tape other taps, parallel and phase 6.3V windings for Sec. 3.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	Wells-Gardner PART No	Halldorson PART No	Merit PART No	RCA TYPE No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T2	Vert. Osc. Trans.	54X110	B6702	A-3003	209T1 ①	Y405	A-8135	26A03	A-97X
T3	Horiz. Output Trans.	51X330	FB440 *	HVO-41 *	213T1 ①	X110	A-8364 & FLY-37 *	FLY-37 *	D-36 &
					212R1 ①		WC-4C ⑤ *		WC-12 ⑤ *
T4	Vert. Output Trans.	51X360	Z1806 ①	A-3039 ①	236T1 ①	V312 ①	A-8141 ①	26B54 ①	A-104X ①
T5A	Yoke-Horiz.(23MM)	53X354-1	DP805	MDF-73	231D3	Y7DF14	DY-8A	Y-4	Y-17
B	Vert.(46MM)								
T6	Horiz. Lin. Coil								
	(1.2-1.6 MM)	9A2262	RF800 ② ③	MWC-4 ⑤	215R1	201R15	WC-8	WC-22	WC-12 ⑤
T7	Width Coil								
	(1-1.6MM)	9A2183			201R4 ③	201R4	WC-4 ⑤	WC-15 ⑤	

① Drill new mounting hole(s).
② Enlarge mounting hole.
③ Connect to terminals #3 and #4.
④ Connect to coded blue and green terminals.
⑤ Drill new mounting hole or use original bracket, slider and core.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
6	13	13	10	13	13	13	10
5	Jumper #10 & #11	Jumper #10 & #11	8	Jumper #10 & #11	Jumper #10 & #11	Jumper #10 & #11	8
4	6	5	7	6	6	6	7
3	4	4	See Note ⑤	4	4	4	See Note ⑤
2	2	2	NC	2	2	2	NC
1	1	1	1	1	1	1	3
A	9	9	2	9	9	9	2
G	8	8	4	8	8	8	1
Connect Width Coil Across	1 & 2	1 & 2	1 & 2	21ZR1 Across #1 & #2	1 & 2	1 & 2	WC-12 (Red & Blue terms)across #1 & #2
Special Notes			⑥				⑥

⑤ No connection to transformer, connect a damping capacitor (approximately 47-68MMF ② 2KV) in series with R110 across horizontal yoke terminals #3 and #7.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI	IMPEDANCE SEC	Wells-Gardner PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T8	5 1KΩ	3.5Ω	51X1668	Z1107	A-2930	A-3877	24S51	S-3X	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V C IMP	Wells-Gardner PART No	QUAM PART No	NOTES
SP1	6"	PM	3.5Ω	12A516	8A1	
	8"	PM	3.5Ω	12A516①	8A3	① Alternate PM speaker
	10"	PM	3.5Ω	12A516①	10A31	

COILS (RF-IF)

ITEM No.	USE	DC RES PRI	DC RES SEC.	Wells-Gardner PART No	MEISSNER PART No	MERIT. PART No	MILLER PART No	NOTES
L1	UHF Ant.Coil	0Ω						
L2	UHF Ant.Coil	0Ω						
L2A	UHF Ant., Mixer, Osc. Coils	0Ω		9A2331-10				Channels 10 thru 19
B	UHF Ant., Mixer, Osc. Coils	0Ω		9A2331-20				Channels 20 thru 29
C	UHF Ant., Mixer, Osc. Coils	0Ω		9A2331-30				Channels 30 thru 39
D	UHF Ant., Mixer, Osc. Coils	0Ω		9A2331-40				Channels 40 thru 49
E	UHF Ant., Mixer, Osc. Coils	0Ω		9A2331-50				Channels 50 thru 59
F	UHF Ant., Mixer, Osc Coils	0Ω		9A2331-60				Channels 60 thru 69
G	UHF Ant., Mixer, Osc. Coils	0Ω		9A2331-70				Channel 70 thru 79
H	UHF Ant., Mixer, Osc Coils	0Ω		9A2331-80				Channel 80 thru 82
L4A	Fil. Choke	0Ω						
B	Fil. Choke	0Ω		31K-137-07				
L5	Cathode Choke	0Ω		31K-137-02				
L6	RF Choke	0Ω						
L7	UHF Coupling	0Ω						
L8	RF Choke	0Ω						
L9A	VHF Ant.Coil	0Ω	0Ω	9A2328-2				Channel 2
B	VHF Ant.Coil	0Ω	0Ω	9A2329-3				Channel 3
C	VHF Ant.Coil	0Ω	0Ω	9A2329-4				Channel 4
D	VHF Ant.Coil	0Ω	0Ω	9A2329-5				Channel 5
E	VHF Ant.Coil	0Ω	0Ω	9A2329-6				Channel 6
F	VHF Ant.Coil	0Ω	0Ω	9A2329-7				Channel 7
G	VHF Ant. Coil	0Ω	0Ω	9A2329-8				Channel 8
H	VHF Ant.Coil	0Ω	0Ω	9A2329-9				Channel 9
I	VHF Ant.Coil	0Ω	0Ω	9A2329-10				Channel 10
J	VHF Ant.Coil	0Ω	0Ω	9A2329-11				Channel 11
K	VHF Ant.Coil	0Ω	0Ω	9A2329-12				Channel 12
L	VHF Ant.Coil	0Ω	0Ω	9A2329-13				Channel 13
L10	Neut.Coil	0Ω						
L11A	VHF RF, Mixer Grid, Osc. Coil	0Ω		9A2330-2				Channel 2
B	VHF RF, Mixer Grid, Osc. Coil	0Ω		9A2330-3				Channel 3
C	VHF RF, Mixer Grid, Osc. Coil	0Ω		9A2330-4				Channel 4
D	VHF RF, Mixer Grid, Osc. Coil	0Ω		9A2330-5				Channel 5
E	VHF RF, Mixer Grid, Osc. Coil	0Ω		9A2330-6				Channel 6
F	VHF RF, Mixer Grid, Osc. Coil	0Ω		9A2330-7				Channel 7
G	VHF RF, Mixer Grid, Osc. Coil	0Ω		9A2330-8				Channel 8
H	VHF RF, Mixer Grid, Osc. Coil	0Ω		9A2330-9				Channel 9
I	VHF RF, Mixer Grid, Osc. Coil	0Ω		9A2330-10				Channel 10
J	VHF RF, Mixer Grid, Osc. Coil	0Ω		9A2330-11				Channel 11
K	VHF RF, Mixer Grid, Osc. Coil	0Ω		9A2330-12				Channel 12
L	VHF RF, Mixer Grid, Osc. Coil	0Ω		9A2330-13				Channel 13
L13	UHF IF Coil	.3Ω						
L14	UHF IF Coil	.1Ω	.2Ω					
L15	Fil.Choke	0Ω		54A-575				
L16	Conv.Plate	.1Ω		31K-164				
L17	IF Trap	.1Ω		9A2320				
L18	1st.Video IF	.1Ω		9A2316				
L19	2nd.Video IF	.2Ω	.2Ω	9A2317		TV-128	6218	Includes 47.25MC trap
L20	3rd.Video IF	.2Ω	.2Ω	9A2318	17-5003 *	TV-128 *	6233 *	
L21	Fil. Choke	0Ω		9A2033	19-1002		4806	2.2 Microhenries
L22	Parasitic Suppressor	0Ω		9A2322				1 turn heavy wire wound on 10Ω resistor
L23	Cathode Trap	0Ω	0Ω	9A2321				
L24	4th.Video IF	.5Ω	.5Ω	9A2319	17-5004	TV-128	6234	
L25	Fil.Choke	0Ω		9A2033	19-1002		4806	2.2 Microhenries

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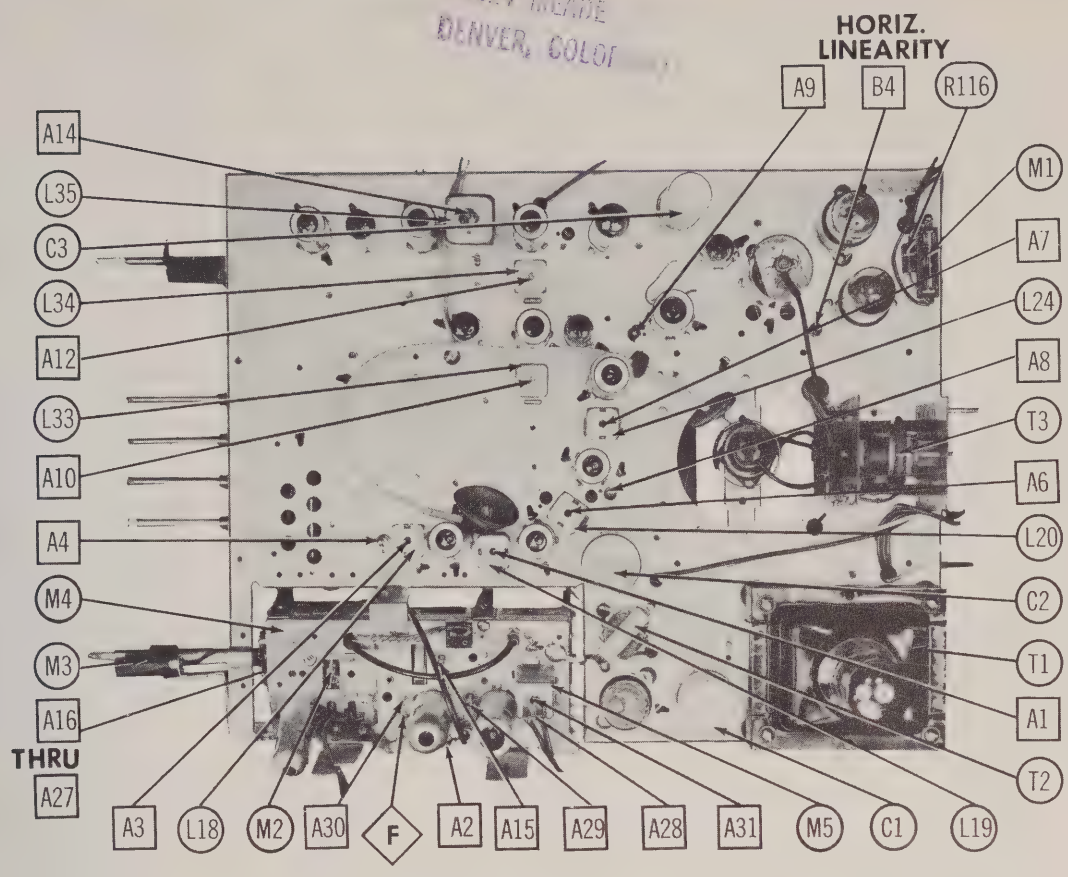
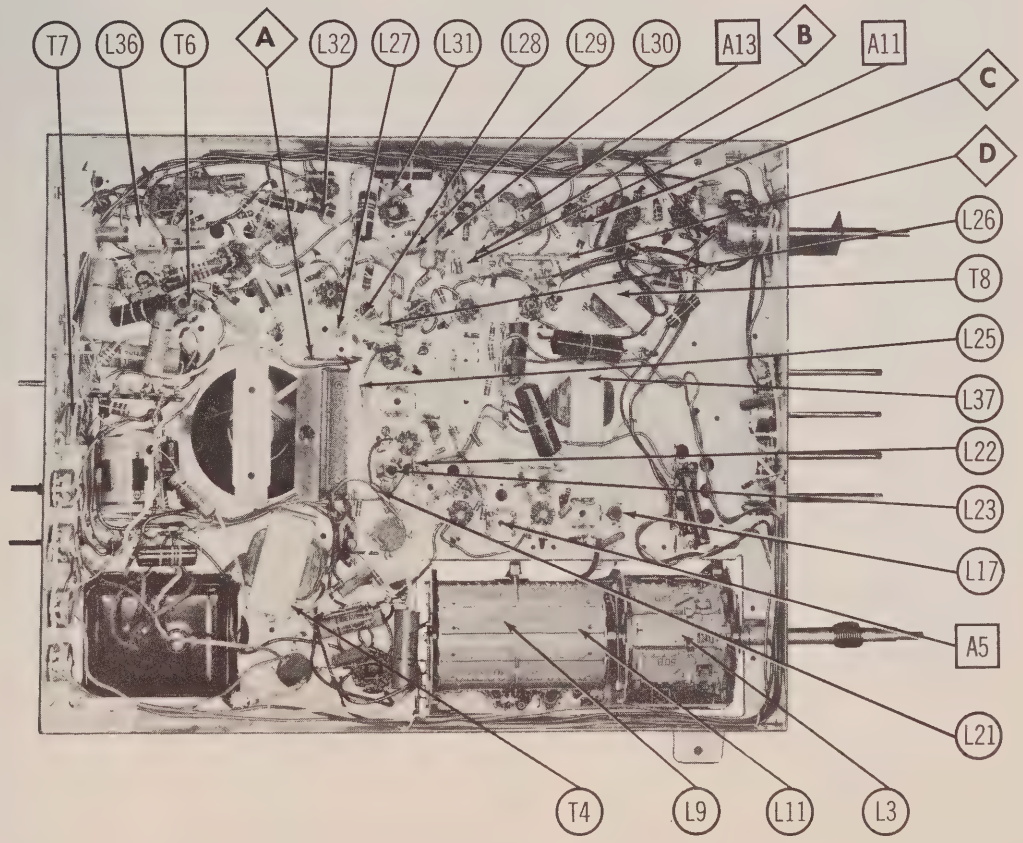


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENT

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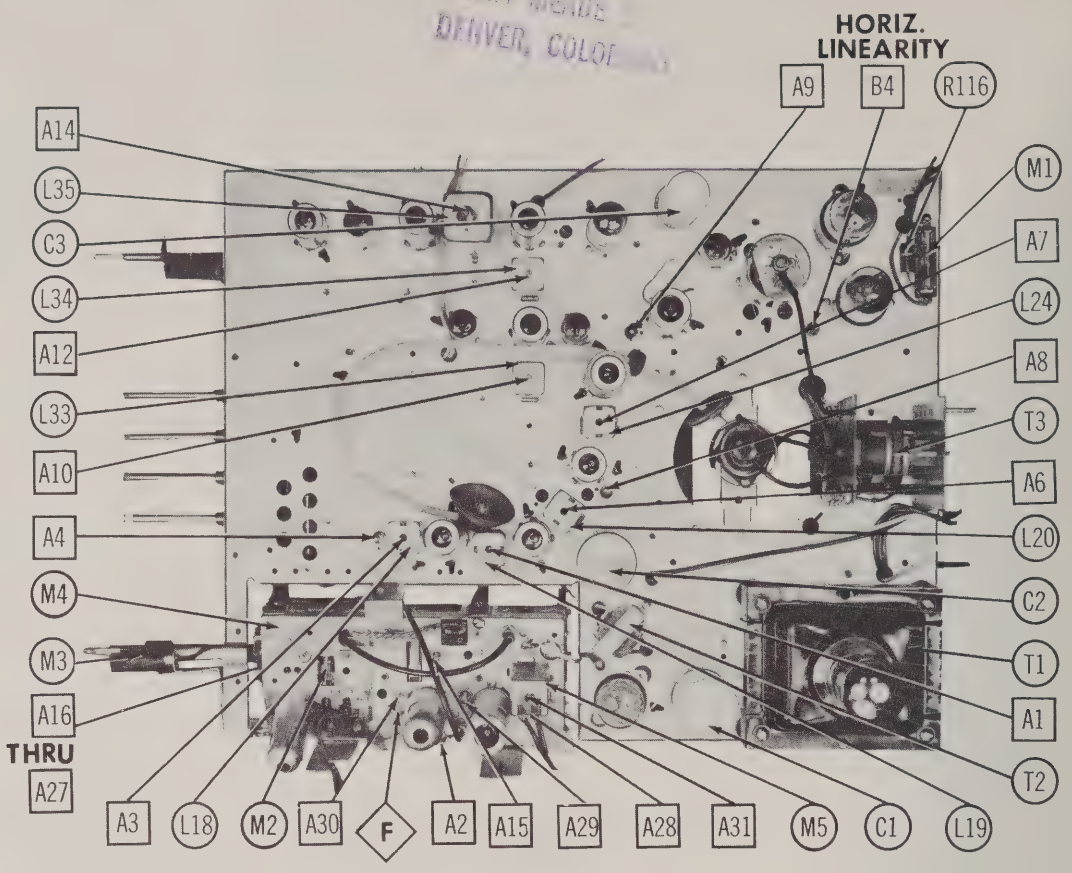

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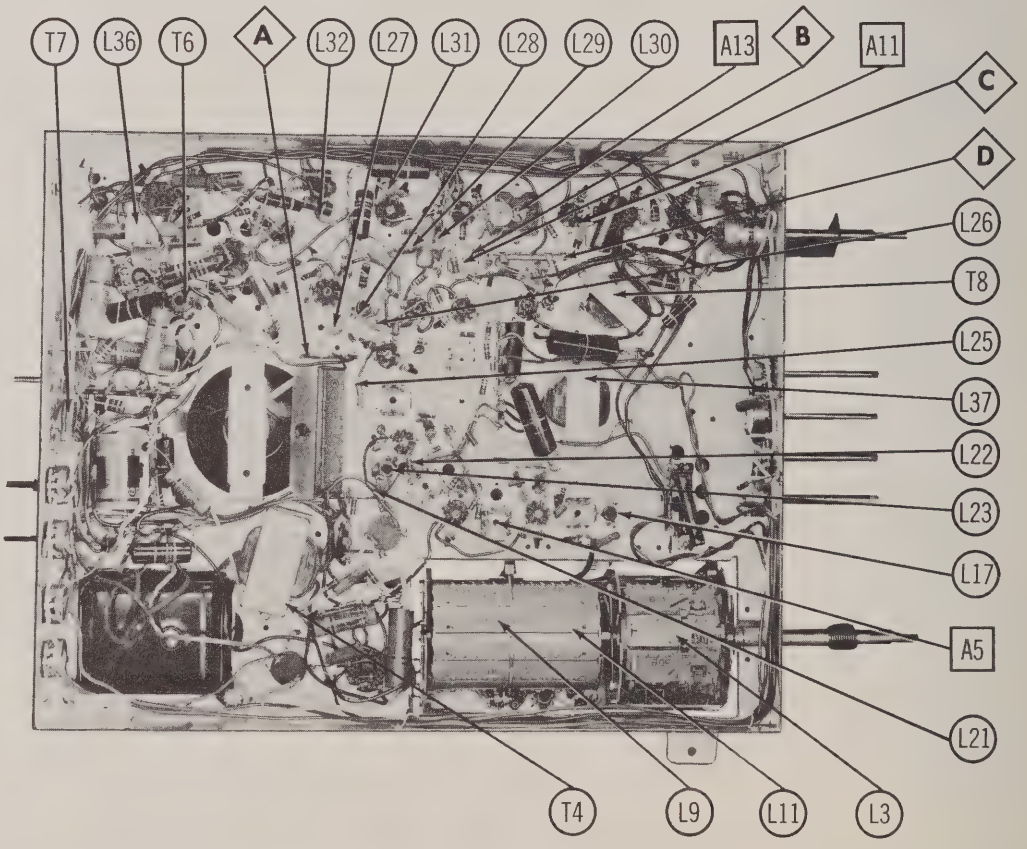

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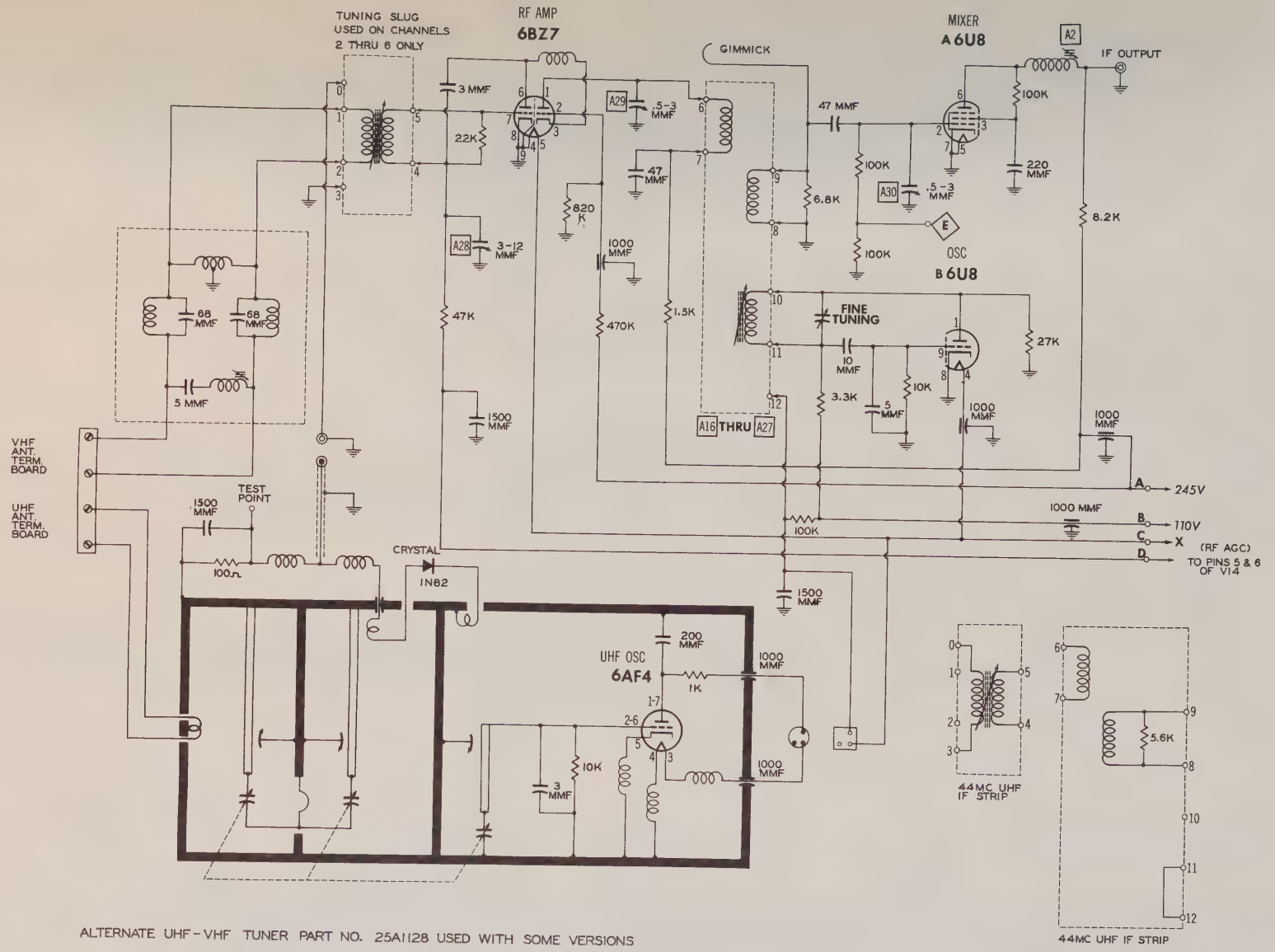

ALTERNATE UHF-VHF TUNER PART NO. 25A1128 USED WITH SOME VERSIONS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ALTERNATE TUNER SCHEMATIC

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Wells-Gardner PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L26	Series Peaking Coil	7Ω		36A10	19-4060		6172 ■	60 Microhenries, wound on 22KΩ resistor
L27	Shunt Peaking Coil	18Ω		36A22	19-3300	TV-185	6155	290 Microhenries
L28	4.5MC Trap	.3Ω		9A2074	20-1004	TV-151	1470	
L29	Shunt Peaking Coil	9.5Ω		36A1	19-3100	TV-181	6177	100 Microhenries
L30	Shunt Peaking Coil	10Ω		36A25	19-3100 ▲	TV-181 ▲	6177 ▲	100 Microhenries, wound on 470Ω resistor
L31	Series Peaking Coil	12.5Ω		36A12	19-4160	TV-184 ■	6180 ■	160 Microhenries, wound on 22KΩ resistor
L32	Shunt Peaking Coil	13.5Ω		36A2	19-3180	TV-184	6154	190 Microhenries
L33	1st. Sound IF	2Ω		9A2201	17-1031 ♦	TV-113 ▲	6203 ▲	
L34	2nd. Sound IF	2.4Ω	2Ω	9A2323	17-3495	TV-113	6203	
L35	Ratio Det.	4.2Ω	.6ΩCT	9A2295	17-3497	TV-115	6205	Tertiary winding -.5Ω
L36	Horiz. Osc.	63Ω		9A2096	19-1576	TV-163	6210	

* Detune trap.
■ Parallel with 22KΩ resistor.
▲ Parallel with 470Ω resistor.
♦ Drill mounting holes.
▲ Use one winding.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA Wells-Gardner PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L37	.240ADC	39.6Ω	1.06HY	52X95	C-5037 ①	C-2996 ①	C-2326 ①	26C44	C-23X ①

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA Wells-Gardner PART No. FUSE	Wells-Gardner PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG S/B	4/10A 125V	16X147-3	16X146	313.400 (3AG S/B 410A)	357001	MDL 4/10	4405

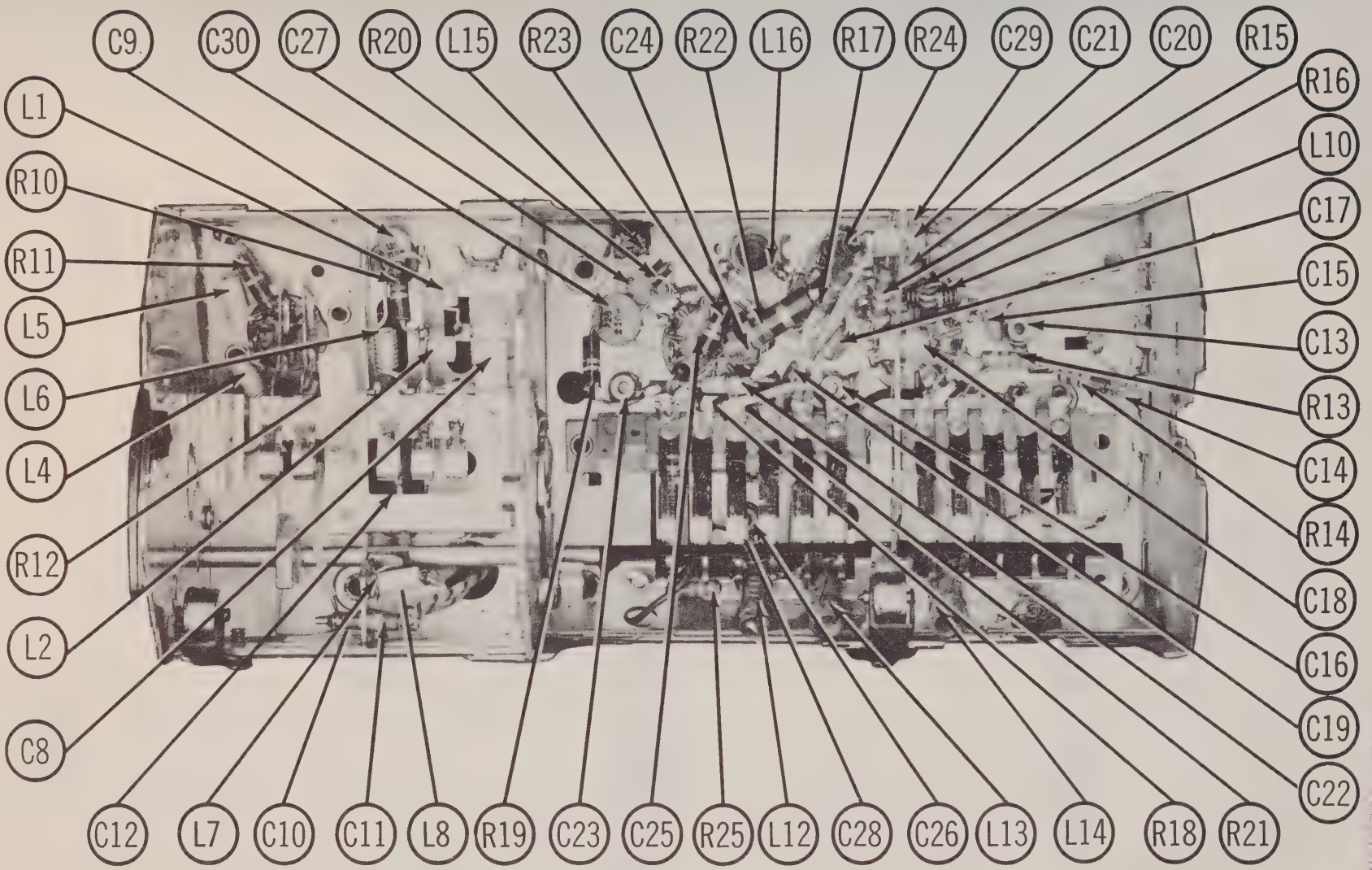
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA Wells-Gardner PART No.	REPLACEMENT DATA SYLVANIA PART No.	NOTES
M2	1N82A*	31K-111	1N82 or 1N82A	UHF Mixer

*Some versions may use type 1N82 crystal diode in this application.

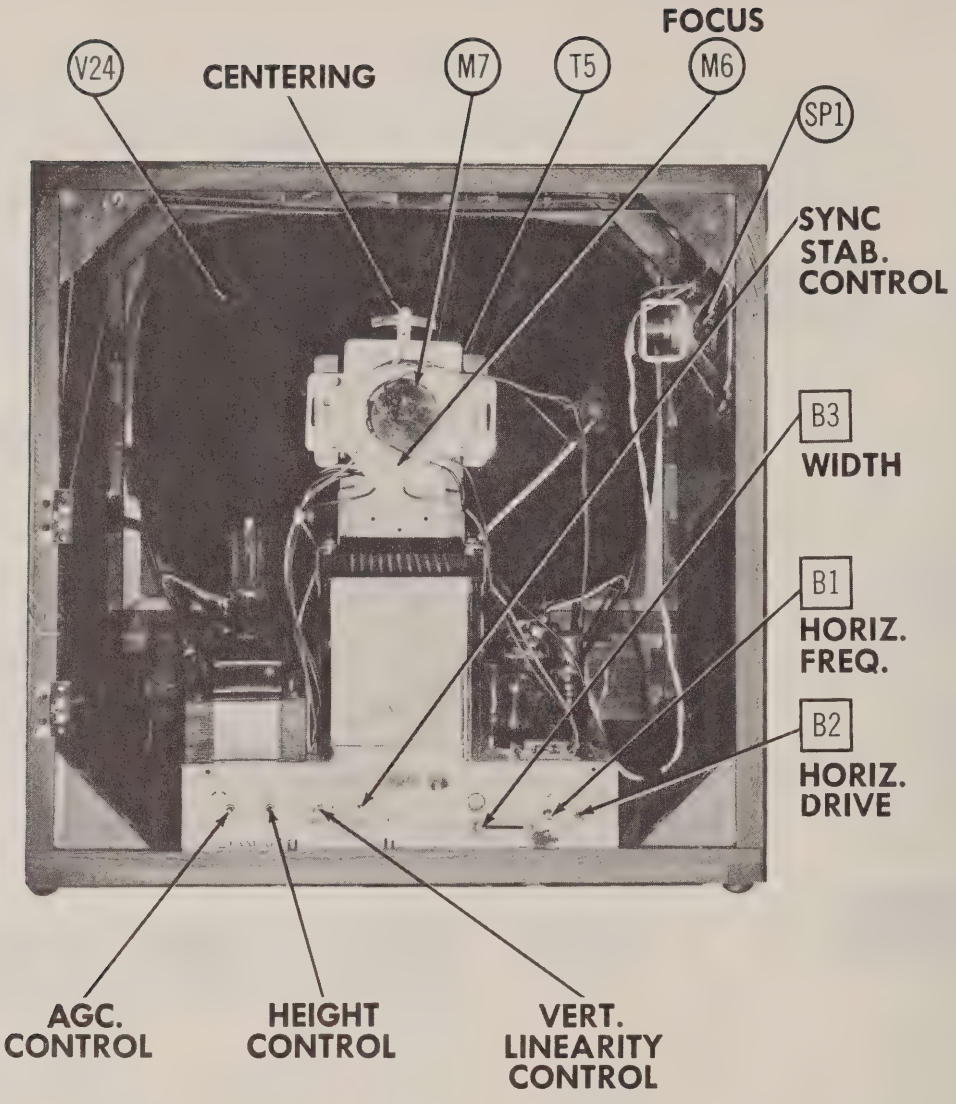
MISCELLANEOUS

ITEM No.	PART NAME	Wells-Gardner PART No.	NOTES
M3	Dial Light	7A32	Type #51
M4	Tuner	25A1124	VHF-UHF combination
	Tuner	25A1128	VHF-UHF combination
M5	Trap	31K-225-03	VHF antenna input filter
M6	Focus Magnet	2A438-2	Includes centering device
M7	Ion Trap	2A421	
	Contact Board Assembly	31K-213	Tuner - Includes L12, L13 and L14
B2	Trimmer Cap	17A269	Horiz. Drive (120-400MMF)
	Knob	10A851-1	UHF channel selector -Maroon
	Knob	10A849-1	VHF channel selector -Maroon
	Knob	10A831-1	Contrast - Maroon
	Knob	10A830-1	On-off-volume-maroon
	Knob	10A851-2	UHF channel selector -beige
	Knob	10A849-2	VHF channel selector -beige
	Knob	10A831-2	Contrast - beige
	Knob	10A830-2	On-off-volume-beige
	Lever Arm	37X343	Fine tuning - All models
	Spring	28X611	Lever arm
	Molding	4X1219-1	Safety Glass - Maroon
	Molding	4X1219-2	Safety Glass - Beige
	Safety Glass	17X180	
	Rear Cover	S-14X89	Table Models
	Rear Cover	S-14X88	Console Models



RF TUNER-BOTTOM VIEW

PROPERTY OF



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control to its mid-range position and adjust the horizontal frequency slug (B1) until picture synchronizes horizontally. Switch off channel and back again. The picture should pull into sync and remain in sync thru 90 degree rotation of horizontal hold control.

Turn the contrast control maximum counter clockwise and adjust the brightness control for a washed out picture.

Adjust the horizontal drive trimmer (B2) clockwise as far as possible without the presence of a vertical white line near the center of the raster.

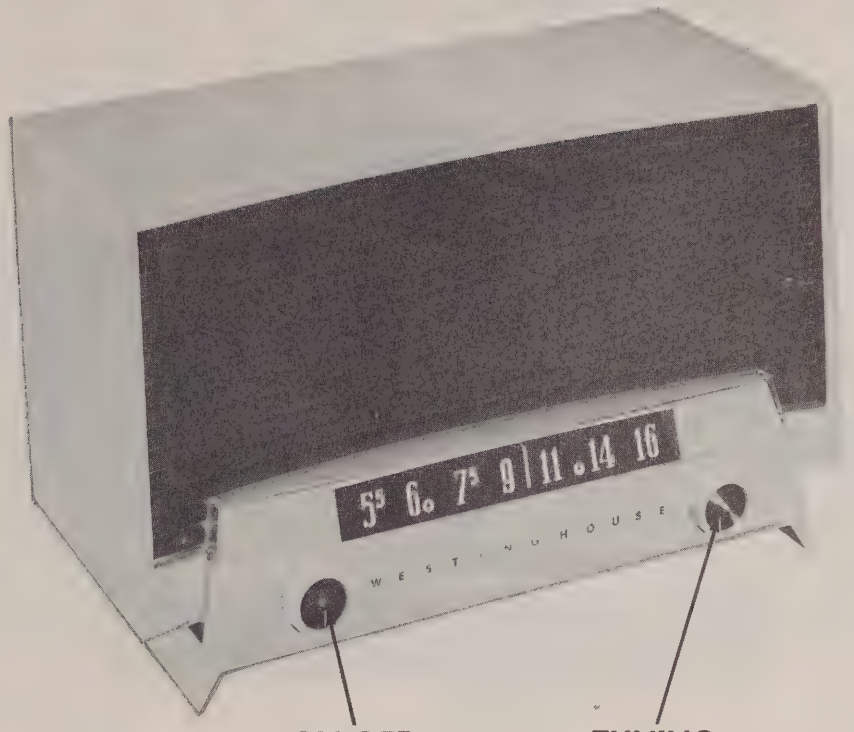
Adjust the width coil (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity coil (B4) for a picture that is symmetrical from left to right.

Recheck setting of B2, then repeat horizontal oscillator adjustment (B1) as above.

WESTINGHOUSE
MODEL H-536T6 (Ch. V-2189-7)

WESTINGHOUSE
MODEL H-536T6 (Ch. V-2189-7)



WESTINGHOUSE
MODEL H-536T6 (Ch. V-2189-7)

TRADE NAME	Westinghouse Model H-536T6 (Ch. V-2189-7)
MANUFACTURER	Westinghouse Electric Corp., TV-Radio Div., Metuchen, N.J.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Six)	Types 12BA6 RF Amp., 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det.-AVC-AF Amp., 35C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC RATING .24 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	200MMF	High side to pin 7 (grid) of 12BE6 (V2). Low side to chassis.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	High side to antenna stator lug. Low side to chassis.	1625KC	"	"	A5	"
3.	"	"	1400KC	Tune to 1400KC signal	"	A6	"
4.		Loop (Radiated)	"	"	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		Westinghouse PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	12BA6	12BA6	7BK	
V2	Converter	12BE6	12BE6	7CH	
V3	IF Amplifier	12BA6	12BA6	7BK	
V4	Det.-AVC-AF Amp.	12AV6	12AV6	7BT	
V5	Audio Output	35C5	35C5	7CV	
V6	Rectifier	35W4	35W4	5BQ	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	Westinghouse PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	■50	150	V-10190-1	FP214	TM-D50-150	D-070	
B	▲50	150					

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	Westinghouse PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	
C2	.05	200	RCP10W4503M	DF-503		PT415	
C3	10000		V-9863-3	DD-103	811-01	DC-511	
C4A	220						
B	5000						
C	5000		♦V-10789-2	♦PC-151	♦1408-02		
D	250						
E							
C5	10000		V-9863-3	DD-103	811-01	DC-511	
C6	.047	400	V-10157-4473M	DF-503		PT4147	
C7	.05	400	RCP10W4503M	DF-503		PT415	

♦ Items C4A, C4B, C4C, C4D, C4E, R9A, R9B and R9C are combined in one unit.
When replacing items separately, items C4D and C4E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Westinghouse PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500KΩ	½	V-9993-12		A47F2-500K	Q19-133X	UT-431	Volume-tap @200KΩ
B	Shaft		Not Req.		FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.		SWE-12	76-1	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Westinghouse PART No.	IRC PART No.	
R2	10KΩ	½	RC20AE103M	BTS-10K	
R3	330Ω	½	RC20AE331K	BTS-330	
R4	22KΩ	½	RC20AE223M	BTS-22K	
R5	68Ω	½	RC20AE680M	BTS-68	
R6	3.3Meg	½	RC20AE335M	BTS-3.3Meg	
R7	47KΩ	½	RC20AE473K	BTS-47K	

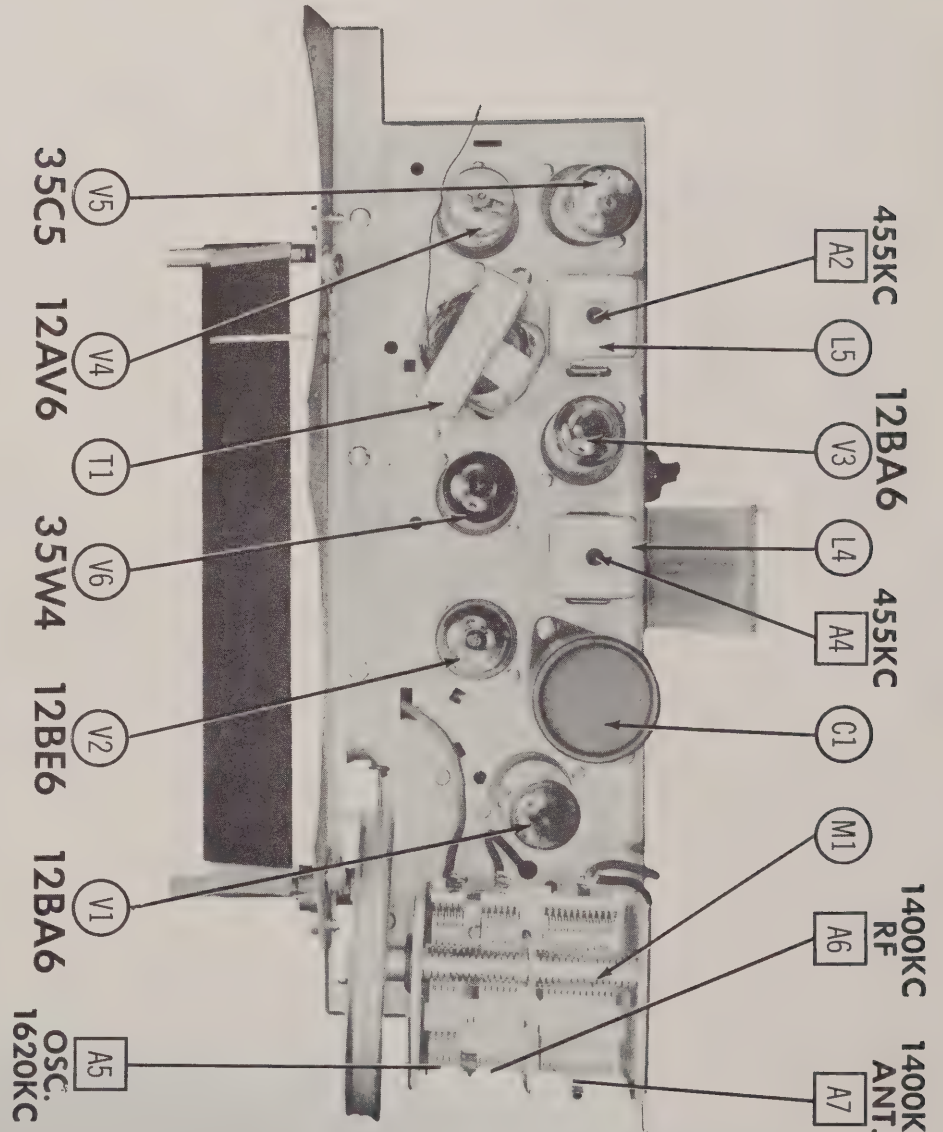
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Westinghouse PART No.	IRC PART No.	
R8	22KΩ	½	RC20AE223M	BTS-22K	
R9A	6.8Meg	½	♦V-10789-2	BTS-6.8Meg	
B	470KΩ	½		BTS-470K	
C	470KΩ	½		BTS-470K	
R10	150Ω	½	RC20AE151K	BTS-150	
R11	1500Ω	1	RC30AE152K	BTA-1500	

♦ Items R9A, R9B, R9C, C4A, C4B, C4C, C4D, C4E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.3KΩ	3.2Ω	V-15937-1	Z1101	A-3025	A-3332	26S58 ①	S-12X	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Westinghouse PART No.	QUAM PART No.	
SP1	4"	PM	3.2Ω	V-11554-1	4A07	

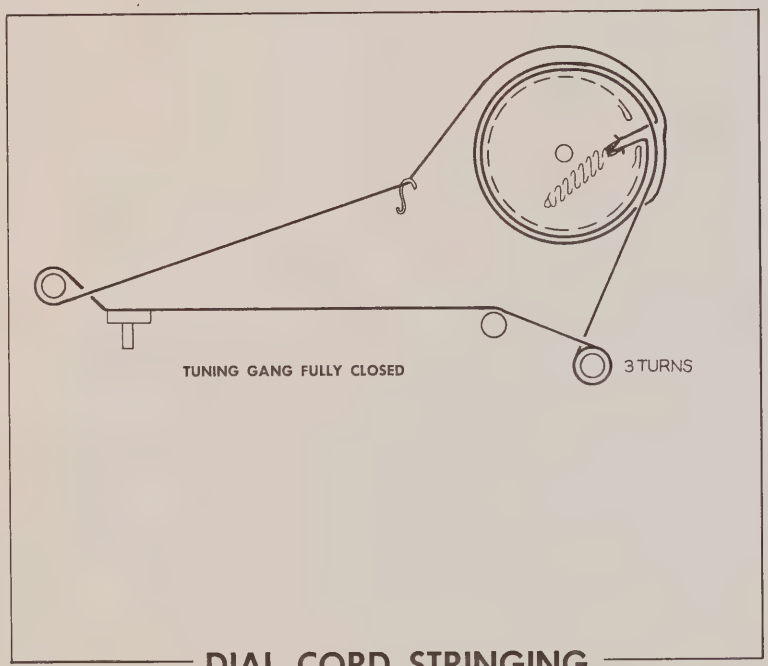
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Westinghouse PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3.6Ω		V-14186-2				Includes cabinet back
L2	RF Coil	3.3Ω*	11Ω	V-10891-1				Tapped @ 6Ω
L3	Osc. Coil	1.1Ω	12.5Ω	V-14408-2	14-1073 *		69-OSC ■	
L4	Input IF	17Ω	17Ω	V-10945-1	16-6758	BC-352	12-C1	
L5	Output IF	17Ω	17Ω	V-10945-1	16-6758	BC-353	12-C2	

* Leads sufficient mounting support.
■ Drill mounting hole.

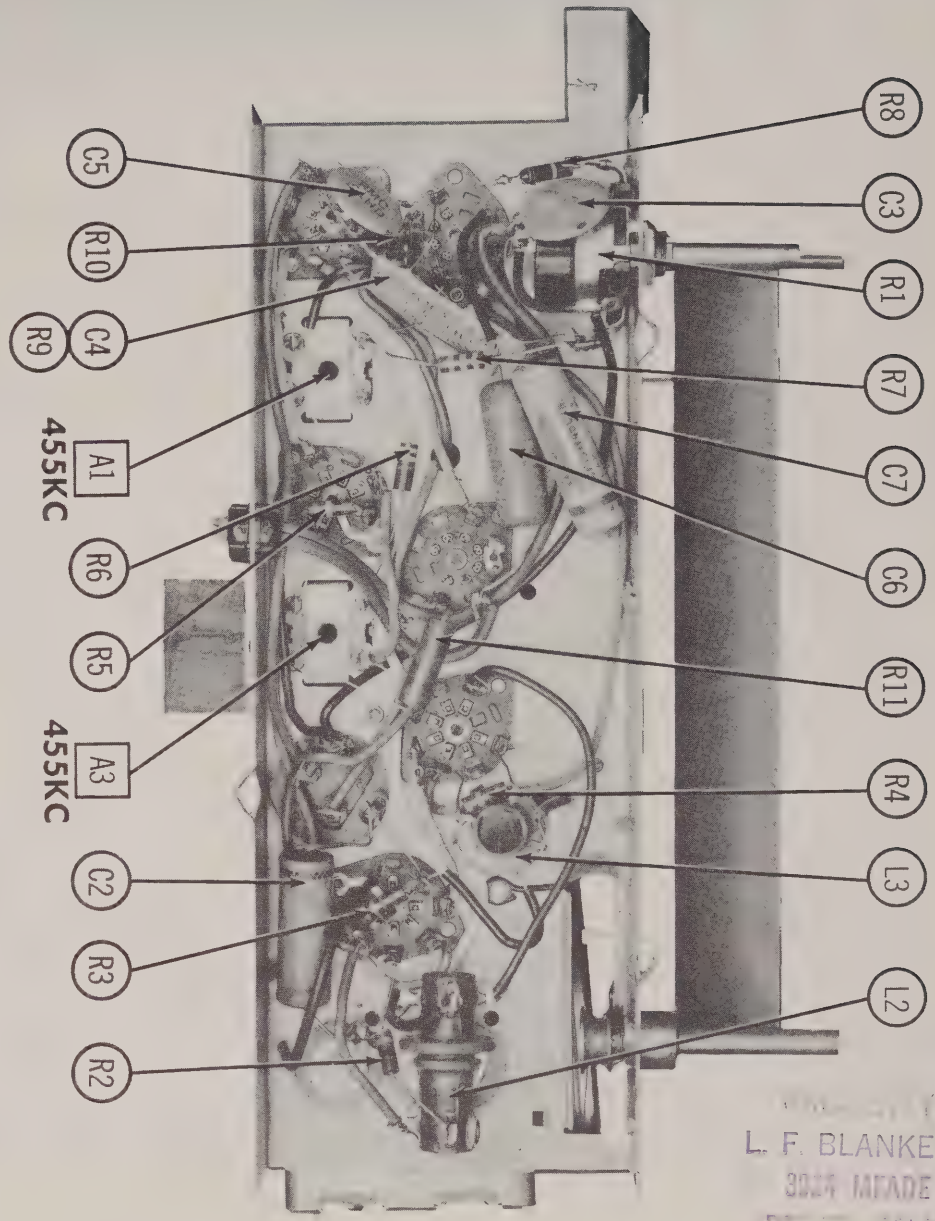
MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M1	Tuning Cap.	V-15647-1	3 Gang (23-360MMF, 14-200MMF, 15-105MMF)
	Cabinet	V-1357-13	
	Knob	V-10408-22	On-off-volume & tuning
	Dial Pointer	V-14227-1	



DIAL CORD STRINGING

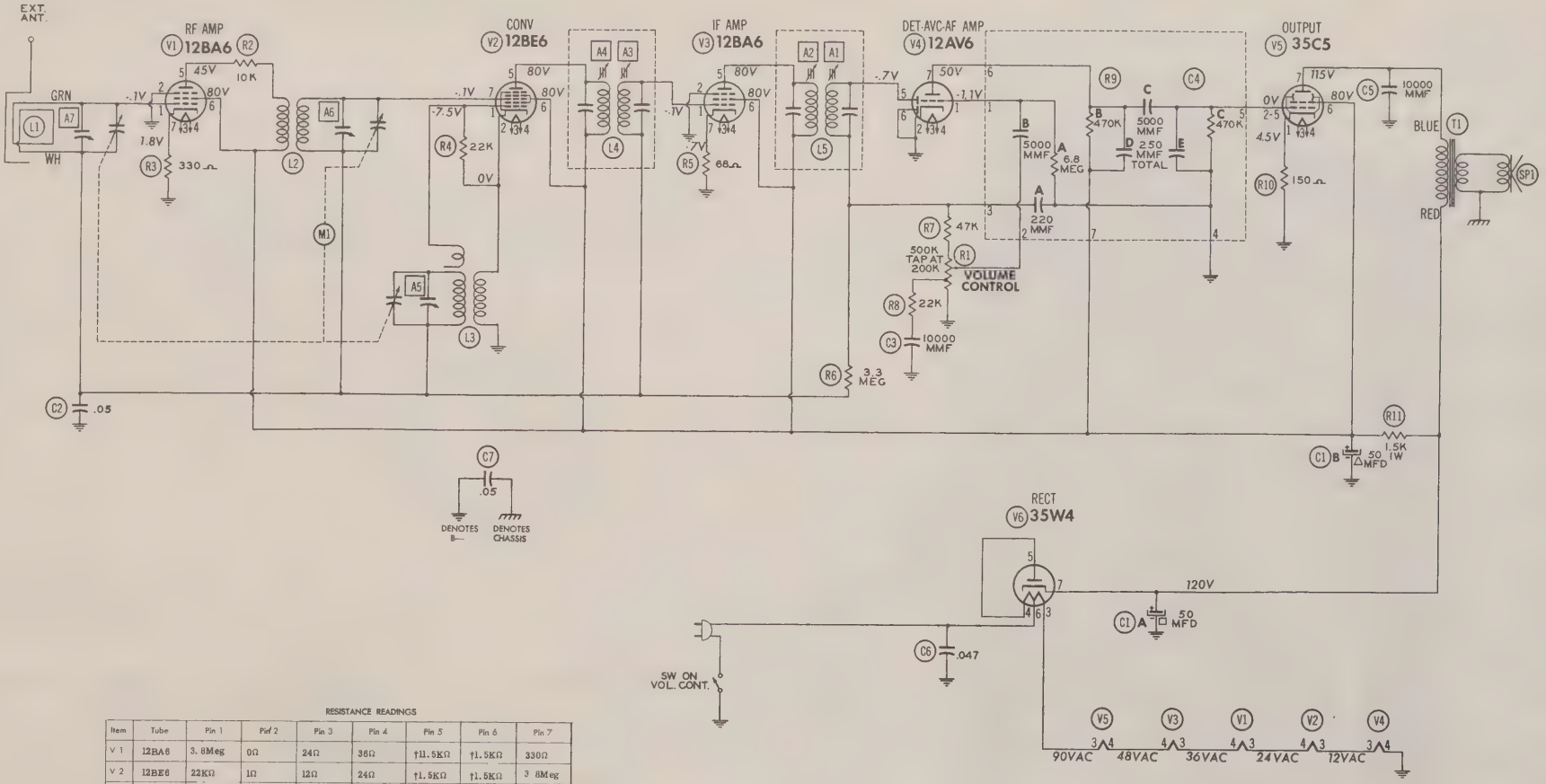
CHASSIS—BOTTOM VIEW



L. F. BLANKENSHIP
3324 MEADE ST
DE 00

WESTINGHOUSE
Model H-536T6 (Ch. V-2189-7)

WESTINGHOUSE
Model H-536T6 (Ch. V-2189-7)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BA6	3.8Meg	0Ω	24Ω	36Ω	†11.5KΩ	†1.5KΩ	330Ω
V 2	12BE6	22KΩ	1Ω	12Ω	24Ω	†1.5KΩ	†1.5KΩ	3.8Meg
V 3	12BA6	3.8Meg	0Ω	36Ω	48Ω	†1.5KΩ	†1.5KΩ	68Ω
V 4	12AV6	6.8Meg	0Ω	12Ω	0Ω	547KΩ	0Ω	†47KΩ
V 5	35C5	150Ω	470KΩ	92Ω	48Ω	470KΩ	†1.5KΩ	†250Ω
V 6	35W4	NC	NC	92Ω	117Ω	117Ω	112Ω	600KΩ

† MEASURED FROM PIN 7 OF V6.
NC - NO CONNECTION.

IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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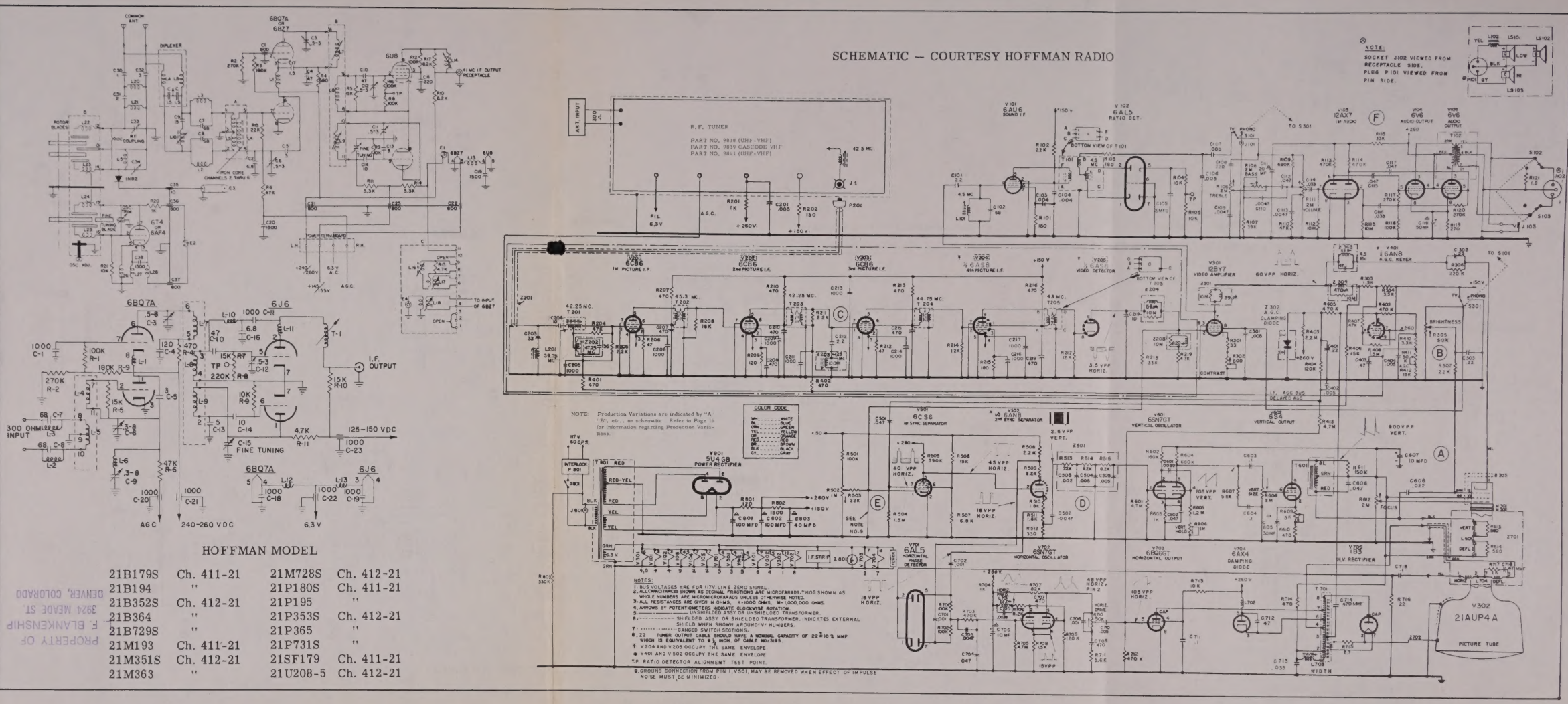
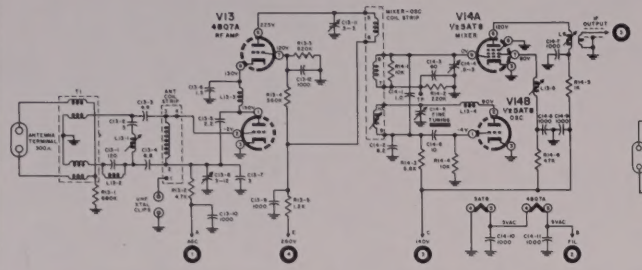
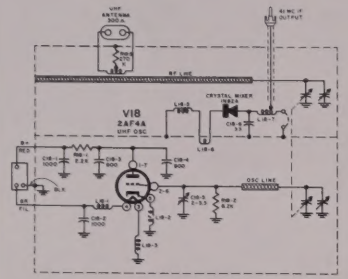

SCHEMATIC — COURTESY HOFFMAN RADIO
B. F. TUNER
PART NO. 9838 (UHF-VHF)
PART NO. 9839 CASCODE VHF
PART NO. 9861 (UHF-VHF)
NOTE:
SOCKET J102 VIEWED FROM RECEPTACLE SIDE.
PLUG P101 VIEWED FROM PIN SIDE.
NOTE: Production Variations are indicated by "A", "B", etc., on schematic. Refer to Page 16 for information regarding Production Variations.
COLOR CODE
NOTES:
1. BUS VOLTAGES ARE FOR 117V. LINE, ZERO SIGNAL
2. ALL CAPACITANCES SHOWN AS DECIMAL FRACTIONS ARE MICROFARADS. THOS SHOWN AS WHOLE NUMBERS ARE MICROMICROFARADS UNLESS OTHERWISE NOTED.
3. ALL RESISTANCES ARE GIVEN IN OHMS. K=1000 OHMS, M=1,000,000 OHMS.
4. ARROWS BY POTENTIOMETERS INDICATE CLOCKWISE ROTATION.
5. ——— UNSHIELDED ASSY OR UNSHIELDED TRANSFORMER.
6. ---------- SHIELDED ASSY OR SHIELDED TRANSFORMER. INDICATES EXTERNAL SHIELD WHEN SHOWN AROUND V* NUMBERS.
7. ·····GANGED SWITCH SECTIONS.
8. 22 TUNER OUTPUT CABLE SHOULD HAVE A NOMINAL CAPACITY OF 22 ± 10 % MMF WHICH IS EQUIVALENT TO 8½ INCH OF CABLE NO. 3193.
‡ V204 AND V205 OCCUPY THE SAME ENVELOPE
* V401 AND V502 OCCUPY THE SAME ENVELOPE
T.P. RATIO DETECTOR ALIGNMENT TEST POINT
9. GROUND CONNECTION FROM PIN 1, V501, MAY BE REMOVED WHEN EFFECT OF IMPULSE NOISE MUST BE MINIMIZED.
V302 21AUP4A PICTURE TUBE

HOFFMAN MODEL

21B179S	Ch. 411-21	21M728S	Ch. 412-21
21B194	"	21P180S	Ch. 411-21
21B352S	Ch. 412-21	21P195	"
21B364	"	21P353S	Ch. 412-21
21B729S	"	21P365	"
21M193	Ch. 411-21	21P731S	"
21M351S	Ch. 412-21	21SF179	Ch. 411-21
21M363	"	21U208-5	Ch. 412-21

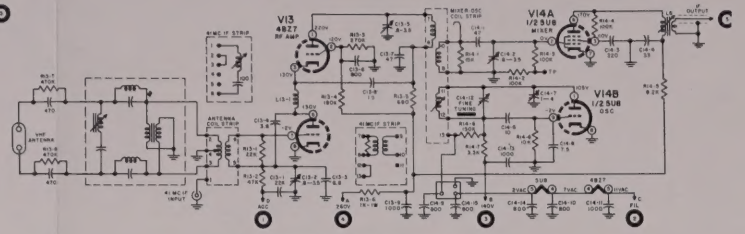
PROPERTY OF
F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO





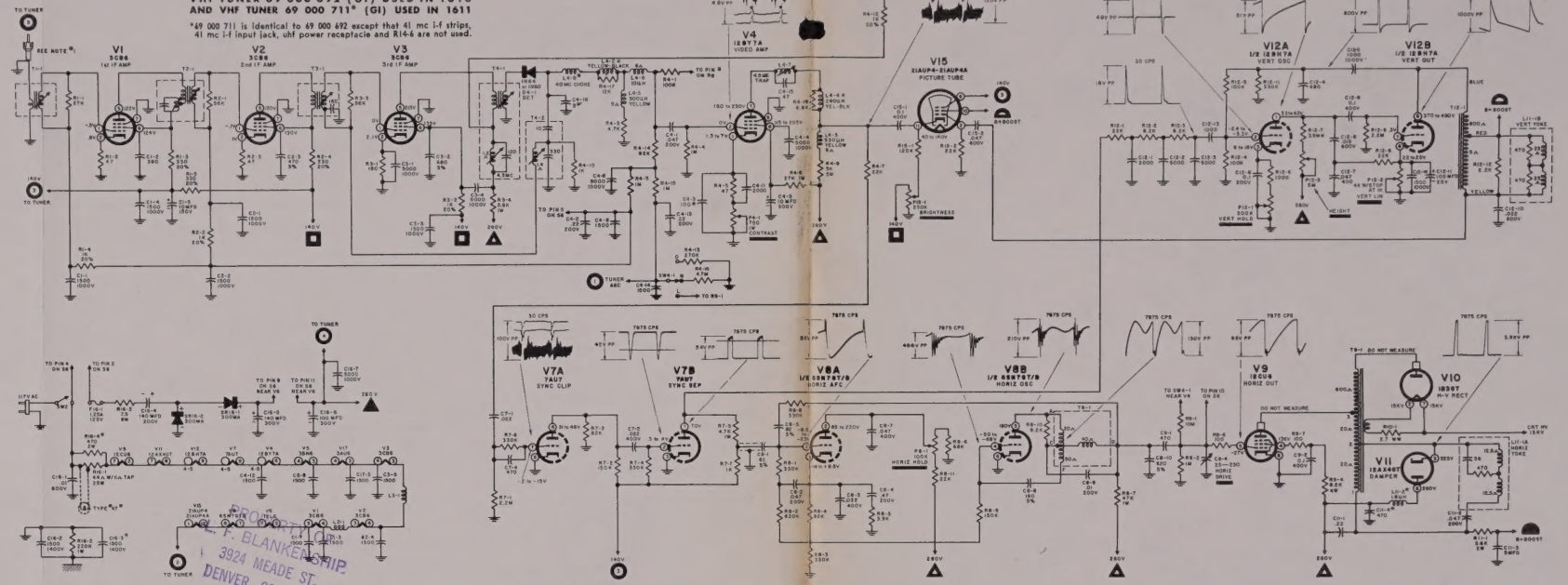
CBS MODEL

U3C627	Ch. 1610
U3C628	"
U3C632	"
U3C634	"
U3C635	"
U3C636	"
U3T602	"
U3T615	"
U3T616	"
U3T621	"
U3T622	"
U3T623	"
U3T624	"
3C627	Ch. 1611
3C628	"
3C631	"
3C632	"
3C633	"
3C634	"
3C635	"
3C636	"
3T602	Ch. 1611
3T615	"
3T616	"
3T621	"
3T622	"
3T623	"
3T624	"



VHF TUNER 69 000 692 (GI) USED IN 1610 AND VHF TUNER 69 000 711* (GI) USED IN 1611

*69 000 711 is identical to 69 000 692 except that 41 mc i-f strips, 41 mc i-f input jack, uhf power receptacle and R14-6 are not used.



PROPERTY OF J. BLANKENSHIP 3924 MEADE ST. DENVER, COLORADO

SCHEMATIC — COURTESY CBS-COLUMBIA

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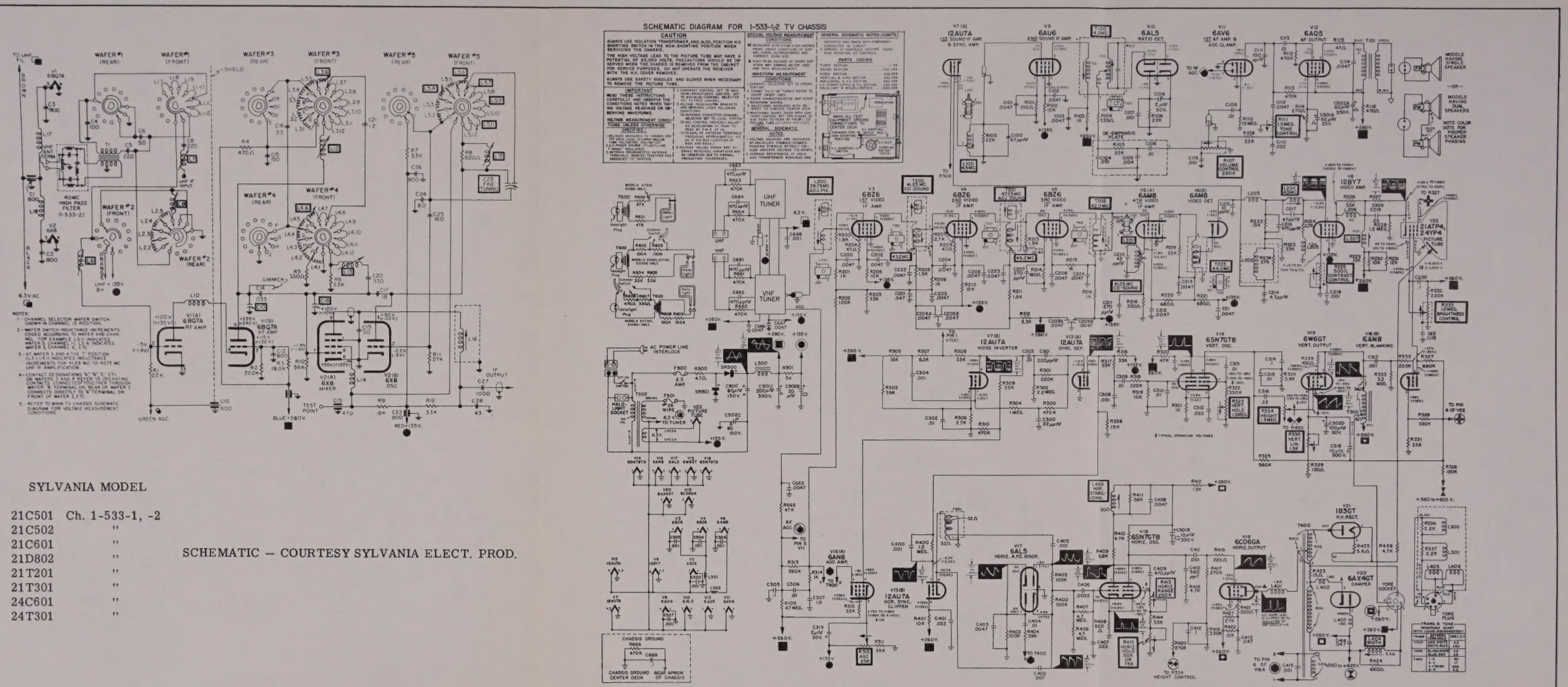
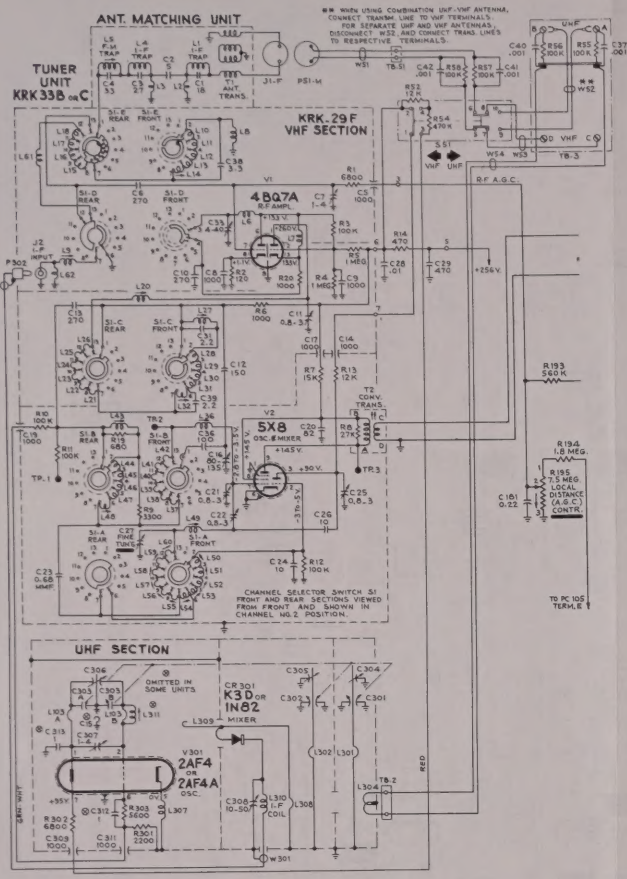
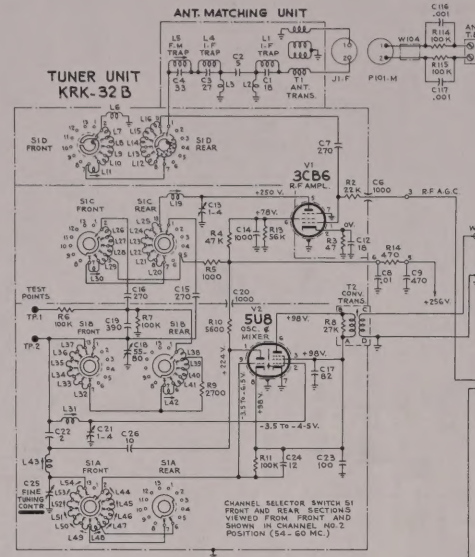


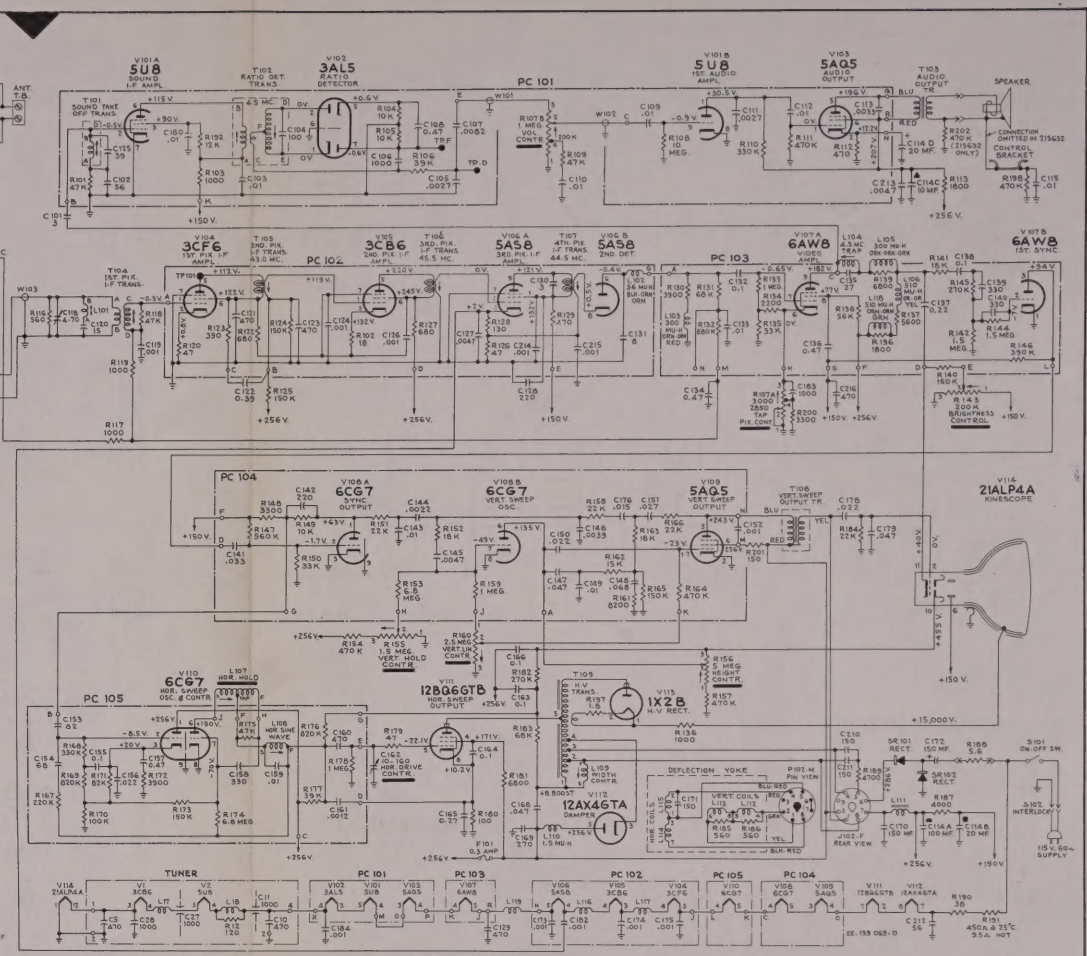
SYLVANIA MODEL

21C501 Ch. 1-533-1, -2
21C502 "
21C601 "
21D802 "
21T201 "
21T301 "
24C601 "
24T301 "

SCHEMATIC – COURTESY SYLVANIA ELECT. PROD.


ANT. MATCHING UNIT
TUNER UNIT KRK33B OR C
KRK-29F VHF SECTION
4BQ7A R.F. AMPL.
5X8 OSC. & MIXER
UHF SECTION
2AF4 OR 2AF4A OSC.
CHANNEL SELECTOR SWITCH S1 FRONT AND REAR SECTIONS VIEWED FROM FRONT AND SHOWN IN CHANNEL NO. 2 POSITION.
TO PC 105 TERM. E


ANT. MATCHING UNIT
TUNER UNIT KRK-32B
3CB6 R.F. AMPL.
5U8 OSC. & MIXER
CHANNEL SELECTOR SWITCH S1 FRONT AND REAR SECTIONS VIEWED FROM FRONT AND SHOWN IN CHANNEL NO. 2 POSITION (54 - 60 MC.)



RCA MODEL

21-S-632	Ch. KCS95A
21-S-632U	Ch. KCS95C
21-S-6052	Ch. KCS95
21-S-6052U	Ch. KCS95B
21-S-6053	Ch. KCS95
21-S-6053U	Ch. KCS95B

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

SCHEMATIC — COURTESY RCA VICTOR

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